The Chemical Age

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Notes and Comments

The Forty-Hour Week

THE problem of the length of the working week is intimately bound up with the economics of industry and with the future of employment. In itself it epitomises a great part of the difficulty confronting the world to-day. The conditions which have led to the suggestion for a 40-hour week are painfully apparent and are known to most of our readers. They were interestingly reviewed by Mr. G. W. Gray in his recent presidential address to the Institute of Mining and Metallurgy. The manner in which the machine has overtaken consumptive power was illustrated by figures taken in the United States over two recent periods. Between 1900 and 1920 the output of manufactured goods increased by 70 per cent., while the number of workers employed to produce these goods increased by only 40 per cent. The United States originated the modern mass production idea so that these figures may not equally apply to the rest of the world.

It is only that the rest of the world somewhat lagged behind the " young man in a hurry " over the water; with a time-lag they would be repeated and are being repeated here. Over the next period the harvest that evidently was ripening during the first period was gathered and during the years 1920 to 1929, whilst output increased by 25 per cent.—the rate of increase was becoming slower as the world capacity for consumption was becoming less—the labour employed actually *decreased* by 7 per cent. These figures were obtained over the four great fields of agriculture, mining, railways and " manufactures." Because employment is less and money is scarcer, consumption is less; Mr. Gray believes that " the possibilities of further economy in the use of labour are enormous," and that, that being so, we have reached a crisis in the affairs of humanity.

Diminution in Hours

IN his address, Mr. Gray pertinently reminds us that " trade recovery," that blessed valhalla for which all the nations yearn, really means a further spurt in technical development—more mechanisation, new construction and the enlargement of the means of production. All these things imply further reduction in the number of working hours required and, therefore, more unemployment, which in turn will plunge us still deeper into the mire. During the whole of the last hundred years there has been a progressive diminution in the working hours, and also in the ages between which employment was allowed or was usual. When the difference between the days when children well below the age of 10 years were employed in coal mines, and the present time, with a school-leaving age of 15 is grasped, when the long working day of 12 or even 15 hours is contrasted with the present, the progress that has been achieved in the past century will be immediately obvious.

But, to quote Mr. Gray, "Much of the unemployment and distress in the world to-day is due to the fact that after a working day of eight hours was gradually and painfully reached in most countries twenty years ago, the movement stopped there in spite of a rise in the average output per worker greater than that experienced in the previous 30 years during which the working week was reduced from 60 hours to 48 or 44."

The Fundamental Problem

THERE can be but little doubt that however much we recognise the importance of economic conferences, of war debts, of changing trades policies and the like, these are but transitory problems which a little common sense and give-and-take can solve. The solution of the fundamental problem is so easy in theory—and so difficult in practice. The real difficulties lie along the direction of international standards of living and of international trade. It may be well for European nations to work shorter hours, but unless *every* nation in the world whose products compete with those of the European nations, some having very low standards of living, agree to work equally short hours and to make their wages adjustments in the same way, the first and most obvious result will be the decreased competitive power of those nations that have reduced hours.

Some industries and some types of employment, moreover, can be adjusted more easily than others. Brain workers benefit by decreased hours and the reduction can be made without much difficulty and with increased efficiency. Certain classes of manual workers, however, may be almost impossible to fit in. Those workers, comprising many in chemical industries, for example, who are operating continuous plants that rest not day nor night may find it difficult or impossible to alter to a 40-hour week. There are many who work in eight-hour shifts continuously for seven days of the week, or at the least, for six days in the week.

New Type of Competition

OVER the 7-day week the reduction of hours would mean an alteration from the eight hour week to the six-hour week. Before making this change we must be sure that the industries which adopt it will not be placed at such a disadvantage that they cannot compete so that the change, instead of resulting in

more employment brings in its train the closing of the industry or factory. It is not only in relation to international competition that these changes *must* be considered. There is springing up a new type of competition. The old form of industrial struggle was competition between firm and firm. That was later, and particularly in the chemical industry, accentuated and partly superseded by the competition between process and process—as witness, for example, the destruction of the value of ammonia as a by-product from the distillation of coal by synthetically produced ammonia; or the virtual elimination of the wood distillation industry by the synthetic production of the chemicals generally and hitherto manufactured therein. To-day, while there is still competition between processes, competition between firms has diminished and is diminishing. Firms are rather tending to market their products co-operatively, as witness the Sulphate of Ammonia Federation or the National Benzol Company, and the Pitch Creosote Associations.

Competition between Products

WE are entering upon an era of competition between products. A group of manufacturers hitherto manufacturing certain chemicals—or other goods—finds its markets invaded by another and possibly synthetic product; as for example, coal and oil, silk and artificial silk, sugar and synthetic sugar, vegetable dyes and synthetic organic dyes. Either that group must fight the competition by improving the product or cheapening its cost; or it may find another outlet—probably at the expense of yet a third product manufactured by someone else. The only alternative is elimination and disappearance from the commercial arena.

The commercial world nowadays, and perhaps particularly the chemical world, is a delicate organism; careless meddling may cause untold dislocation. On all these practical grounds must the proposal for a reduction of working hours be examined. There was never a time within our recollection when it was more imperative that something should be done; there was never a proposal more deserving of careful consideration than the reduction of working hours; but there never was a clearer or more obviously proven case for "making haste slowly."

The International Aspect

IT is therefore with pleasure that we note that the International Labour Conference at Geneva has refrained from framing with head-long haste the policy of a 40-hour week as a remedy for unemployment in a draft convention, but has referred the proposal to the Governments of all countries for careful examination. The proposal was put forward as an economic measure for adjusting supply and demand by increasing purchasing power to a capacity to absorb the larger output of the modern machine. By that standard it must be judged.

The decision of the Labour Conference has evidently been dictated by the wise desire to learn the probable effects of a 40-hour week in each country and the relative effects in one country as compared with another. Sir Arthur Steel-Maitland, as Minister of Labour, answering criticisms directed against the delay, has said that he believes that the international limitation of hours of work is possible, but that the history of the eight hours convention was a warning against proceeding without due regard to the practical difficulties. That convention was so loosely drafted that any Government which ratified it might have escaped the obligation which it was intended to impose. We cannot afford to make chance experiments to-day; but, on the other hand, we cannot afford to do nothing. The chemical industry is particularly interested in the proposals, and we should be interested to hear of any particular hardships or difficulties involved.

Co-operation

THE chemical plant manufacturer is not a magician; he has no Aladdin's lamp by which he may summon the Genie who will grant his desires and answer his questions. The fundamentals of chemical engineering are at his fingertips; the best of many materials of construction are in his works awaiting the order to be fabricated by various methods each with its own particular advantage. He is ready to supply a plant which will fully meet requirements. But the chemical manufacturers must tell him what is required; confide in him, and provide him with all possible data which relate to manufacturing conditions. We recall a case where the coils in a plant were said to be required for cooling purposes using cold water, but actually were to be used for heating by steam. The manufacturer distrusted the plant maker, but the plant maker was a good fellow with a sound knowledge of manufacturing operations, and he could not be hoodwinked. So he offered alternative suggestions to meet the fictitious and the real case, pointing out the merits of each group of coils in regard to adaptability. It was a tactful way of retaining a valuable customer and of serving him well and truly.

Spade Work

WE have all had bright ideas. They have included modifications to some stage in a well established manufacturing process, the working up of some new raw material or waste product, the design of a heat exchanger which will be a plant unit of 100 per cent. efficiency. Like the inventor of the perpetual motion machine, we have revelled in their immense possibilities; sketched flow-sheets and plant details until the early hours of the morning, for without such bright ideas the world would make no progress. The economic aspect has often received only the slightest consideration and we have immediately rushed to the Patent Office to file our provisional specification, ultimately making good use of the free services of the plant makers in quoting for our needs. The Patent Office is duly remunerated for the minor service which it actually renders at this stage of provisional protection, but the plant maker has to take his reward from the hope that the inquiry may develop into an order. If only we told him at the outset that the scheme was tentative and that we really wished to investigate its practicability, he could be spared much time and trouble which detailed specifications and blue prints demand. All plant makers are willing to help within reason, but to quote for schemes which have to be modified a hundred times before they are workable—if ever—is not exactly a commendable practice.

British Chemical Trade Mark Law

The Joint Committee's Memorandum

THE Joint Chemical Industry Trade Marks Committee, appointed some months ago, has issued its memorandum on trade mark law, which was used as the basis of evidence submitted to the Board of Trade Committee on British Trade Mark Law and Practice. The joint committee comprised representatives of the Association of British Chemical Manufactures, the Institute of Chemistry, the Institution of Chemical Engineers, the International Society of Leather Trades Chemists, the Society of Chemical Industry, the Society of Glass Technology and the Society of Public Analysts, while the Biochemical Society, the Faraday Society, the Institution of Gas Engineers, the National Federation of Associated Paint, Colour and Varnish Manufacturers and the Society of Dyers and Colourists were also kept informed of the work of the committee and had the opportunity of examining and expressing their views on the final memorandum. Mr. A. J. Holden, of the Association of British Chemical Manufacturers, acted as secretary of the committee.

Descriptive Marks

The memorandum suggests that some guidance might with advantage be given to the Registrar in the matter of "descriptiveness." It is not always easy to see why some marks are held to be descriptive and others are allowed. It might be possible to enunciate some guiding principle in the Act. The view is largely held, for example, that no trader has a right to register a mark which would deprive the public of the use of words or phrases which it might some day desire to apply to the goods in question either in ordinary writing or conversation, or as business slogans—*e.g.*, Everite, Slugicide, etc.—but that a mark ought not otherwise to be refused as descriptive.

Appeals from the Registrar's decisions on trade mark questions lie either to the Board of Trade or the High Court. The decision of the Board of Trade is final; that of the High Court is subject to appeal to the Appeal Court and eventually to the House of Lords. The Patents Appeal Tribunal set up in November, 1932, has worked excellently and has given great satisfaction. On the other hand, there is in trade mark cases a feeling, which may or may not be well-founded, that the Board of Trade is not the most satisfactory tribunal to hear an appeal from a decision of one of its own departments. The cost of an appeal to the Board of Trade is high, and that of an appeal to the Court is prohibitive except in the most important cases, and it is pointed out that the importance of a mark is not always apparent at the time when it is the subject of litigation.

The decisions of the Registrar are in many cases proper subject matter for an appeal as is indicated by numerous inconsistencies, and the existence of an Appeal Tribunal, identical with or constituted similarly to the Patents Appeal Tribunal, would afford valuable guidance to the Registrar in this respect.

Assignment of Trade Marks

Prior to 1905 the registration of a trade mark was nothing more than an official recognition, serving in place of formal proof, of the fact that the mark did in fact denote that the goods had a particular origin. Every registered mark was a user mark. The Act of 1905 for the first time admitted to registration marks which were merely capable of becoming user marks. This change involved a change in the fundamental theory underlying trade mark law. A registered trade mark may now have, or may acquire, intrinsic value apart from any business of which it may be the label. The inventiveness of a mark or its appropriateness from a sales point of view may give it a value before it has been used on a single article. The 1905 Act vests this value in the registered owner, and since it is not necessarily associated with actual user there is some reason for suggesting that such a mark ought to be assignable with no other "goodwill" than that which is intrinsic to the mark itself.

The committee recommends that suitable amendments should be made in the existing law so as to provide for the following points:—(i) That a registered trade mark which has not been associated, or is no longer associated, with goods, should be freely assignable without reference to goodwill other than that intrinsic value which it may possess and which may be the basis for a future goodwill; provided always that such assignment, in the case of a mark which has been associated with goods, is not calculated to deceive the public; (ii) that a registered trade mark should be assignable with the goodwill in the particular goods upon which it has been used, even when the goodwill in goods of the same class distinguished by a different trade mark is not assigned; (iii) that a parent company and its subsidiaries should be allowed to use in common a mark (*e.g.*, a house mark) registered by the parent company, and (iv) that a parent company should be allowed to use any mark registered by its subsidiary companies.

Connection between Goods and Owner

A trade mark, according to the 1905 Act, must indicate that the owner of the mark manufactures or selects or certifies or deals with or sells the goods bearing the mark. It occasionally happens that the owner of a mark which denoted manufacture and sale decides to cease manufacture himself and to have the goods made for him by someone else, while still continuing to sell the goods under the same mark. Obviously if the continued use of the mark by the owner deceives the public, the mark is liable to forfeiture. Deception will only occur, however if the public has come to recognise the mark as indicating manufacture only, and this might be the case where by advertisement or otherwise the owner has encouraged this connotation.

It should be made clear that so long as the relation between the goods and the owner of the mark remains within the definition, no change in that relation will endanger the mark. Such provision would, in fact, avoid the possible deception referred to above, for the public would be instructed by the Act that a mark may not be assumed to indicate for all time the particular relation between owner and goods which holds initially.

No trader should be allowed to commit the offence of labelling goods in this country with the registered mark of another trader for the purpose of exporting the goods to another country. It is suggested, therefore, that the existing law be amended in the following respects: (a) It should be clearly defined that the use by one trader of the registered mark of another in any manner, even though the goods so marked are not proposed to be offered for sale in Great Britain, shall constitute an infringement, and (b) that a fine recoverable summarily should be imposed as a penalty for such offence in addition to any other remedy already existing.

Unauthorised Use of Marks

While under the 1905 Act the registered proprietor of a trade mark is given the exclusive right to use the mark upon or in connection with the goods in respect of which it is registered and therefore is entitled to prevent unauthorised use of his mark by another trader, in practice considerable difficulties have been encountered. In the case of butter, for instance, it is extremely difficult to detect substitution of another butter and only the addition of chemicals which contravene the Food and Drugs Acts might enable such deception to be discovered. Moreover, a dishonest retailer in the butter trade cannot be prevented, at present, from undercutting the honest retailer while utilising the regisered mark.

In the case of chemicals and drugs supplied in bulk to pharmacists, the latter freqently sell in smaller quantities and this practice may be objectionable to the registered proprietor. It is suggested that the rights obtained by registration of a trade mark should embrace the exclusive right to affix the trade mark, and the exclusive right of a mark should include the right to prevent the use of the mark in relation to the goods by any other person, whether as a trade mark or otherwise, without the expressed consent of the registered owner.

Difficulty has been encountered owing to the fact that goods sold under a mark registered in one class may at some time be found to conflict with goods sold under the same or a similar mark registered in another class, owing to the fact that both articles have come to be sold by the same type of retailer, though it may not have been originally anticipated that they would be so sold. The rapid advance in chemical knowledge is leading to the continual discovery of new uses for chemical products, and this type of confusion is likely to increase. It is possible to conceive of cases of actual danger arising through confusion between poisonous substances and food products sold by the same retailer under similar marks. A grouping of classes in accordance with trade distribution would meet this objection, any trade mark registered in one class of a group being citable against an application in any class in the same group. This would prevent the registration in respect of any goods of a trade mark which, even if not identical with any trade mark already registered in respect of the same goods, so nearly resembles such trade mark that where both classes of goods are likely in the ordinary course of trade to be distributed or sold by the same retailer or in the same shop, confusion or deception might result.

Empire Trade Marks Convention

The registration of a trade mark in Great Britain confers no protection to the mark in countries outside Great Britain. If protection be desired in any of the Colonies or any foreign country, a separate application must be lodged in such colony or foreign country. By virtue of the arrangement relating to the international registration of trade marks made at Madrid in 1891 and revised at Brussels, Washington, and Hague in 1900, 1921, and 1925 respectively, a national of one of the contracting countries and any other person who is approximated for this purpose to such a national is able, having registered his trade or manufacturer's mark in his native country, to deposit that mark with the International Bureau at Berne and thereby secure protection for it in all countries adhering to the arrangement. Neither Great Britain nor any part of the British Empire was a party to the arrangement, nor has subsequently joined it, though Great Britain is a party to the convention under which the arrangement was constituted. The suggestion is made that there should be a British Empire Trade Marks Convention formed on the lines similar to the Berne Arrangement, under which subjects of the various parts of the Empire would be assured of the protection of their marks throughout the Empire.

By means of an Empire Convention existing anomalies would be done away with, the Empire deposit sufficing to secure protection in the whole Empire or such parts of it as became parties to the convention.

Possible Objections

The following objections to the formation of such an Empire Convention may be raised. It may be submitted that each territory constituting the union formed by the British Empire Convention would lose considerable fees by reason of there being only two fees payable, the one in the territory of origin and the other at the Empire Office. Upon this point it is submitted that, even assuming a serious loss of fees, the advantage to be derived from the proposed convention would by far outweigh the disadvantage caused by the loss of fees—it is not admitted in any case that there would necessarily be a net loss of fees. This submission is based on two grounds, both of which were enunciated by Mons. Frey-Godet, then secretary of the International Bureau at Berne, in a paper read by him before the London Congress of the International Association for the Protection of Industrial Property in 1898. He was then dealing with Great Britain's possible objections to joining the Berne Convention, but his remarks are equally applicable to the case of, say, a colony of the British Empire refusing to join the Empire Convention: (a) a contracting party could not grudge the expenditure of a few hundred pounds in order to be assured of a valuable advantage to its commerce; (b) it is by no means certain that the fees collected by a territory on Empire applications effected through its own administration, added to the money derived from the surplus receipts of the Empire registration service, would not make up for the diminution in the number of ordinary registrations.

With regard to the question of gross loss of fees, the records of the Patent Office have been searched and inquiries made at Australia House, Canada House, etc. Few of the territories comprising the British Empire publish an annual Patents, Designs and Trade Marks Report, and in only one case is there a report which gives statistics showing the countries of origin of applications for the registration of trade marks. In that one case, New Zealand, it is possible from the statistics given to ascertain approximately what proportion of the total fees in any year came from applicants in territories forming part of the British Empire. Assuming the suggested British Empire Convention to be in force and, further, assuming that no applications would be made in New Zealand by any applicant from any part of the British Empire except New Zealand, the gross annual loss of fees suffered by New Zealand based on an average of the figures for 1929, 1930 and 1931 would amount to £1,356.

A Stimulant to Trade

If the second fee securing Empire registration were to be fixed at such a figure as would ensure a considerable surplus of receipts over expenditure in each year, then upon a distribution of that surplus each territory would gain rather than lose upon fees. The trader would not object to paying a substantial sum to secure protection of his mark in the whole of the British Empire. The more territories that join the British Empire Convention the more advantageous would be the service effected by such convention, and it is appreciated that to render the convention completely successful in that respect it would be necessary that those parts of the Empire which have no trade mark law should forthwith legislate accordingly—a comparatively simple matter, as the trade mark laws of Great Britain could be copied and unanimity of trade mark law would thus be assured. It is believed that at the present time, when the importance of Empire trade cannot be over-emphasised, the inauguration of such a convention would be a powerful stimulant to that trade.

Copies of the memorandum can be obtained from the Association of British Chemical Manufacturers at a cost of 1s. per copy.

New Dyestuffs

A New I.C.I. Printing Ink Colour

THREE new dyestuffs have been placed on the market by Imperial Chemical Industries, Ltd. Monolite Red 4RS is offered in paste and powder forms and is a pigment dyestuff similar in shade, as a printing ink colour, to the calcium lake of Monolite Rubine 2BS paste but possessing a cleaner undertone. It possesses good fastness to light, lime, alkali and water and, therefore, is eminently suitable for the manufacture of printing inks of all classes, enamels, oil and water paints, distempers and for all purposes where the above fastness properties come into consideration. Owing to the particularly good alkali fastness, it is well adapted for the manufacture of inks for soap wrapper printing or for exhibition carton boards where the ink has to withstand long exposure to light and very often the presence of alkali in the card substance. This colour also finds use in the wall-paper and paper surfacing trades and for the colouring of linoleum and flooring compositions.

Durindone Scarlets 2B and 3B, important additions to I.C.I. dyestuffs, are eminently suitable for application to all types of cotton materials, giving bright scarlet shades of excellent fastness to washing, boiling, bleaching, etc. Their excellent fastness to kier boiling make them of particular interest for the dyeing of cotton yarns, warps, etc., which are to be woven with grey materials and subsequently bleached in the piece. They are very suitable for the direct printing of cotton, viscose and natural silk giving good results by a potash—Formosul recipe, as they produce bright scarlet shades possessing excellent fastness to chemick and good fastness to severe washing. These products can also be used for ground shades on cotton for the production of white effects by the Formosul—Metabol process. They are applicable to viscose artificial silk and possess the valuable property of producing even shades on material of irregular quality. Their good fastness to degumming and light makes them interesting for the dyeing of natural silk; whilst their penetrative properties are such that they are specially suitable for the dyeing of linen.

Research Under the Empire Marketing Board

Storage Problems for Natural Produce

IN spite of the necessity for strict economy, investigations carried out by the Empire Marketing Board during the year ending May, 1933, have continued in respect of the storage and marketing of a surprising variety of products. There is a note of regret in the board's annual report that support for new and promising research activities has had to be postponed or withheld. A prominent place, however, has been given to food preservation and low temperature research at several laboratories. Last year's report gave an account of the action taken by the Board to give effect to the recommendation of the Imperial Conference of 1930 in regard to the planning of joint programmes of research on a broad Empire basis. Further replies to the Board's letter of March, 1931, have now been received, a significant feature of these and previous replies being the striking measure of agreement among the Empire's scientific authorities as to the problems most urgently requiring further research in the general economic interests of the Empire.

The Board has continued to support low temperature research at Cambridge and at the Ditton Laboratory, East Malling, and research into the preservation and transport of fish at Aberdeen.

Storage of Frozen Meat

At the Cambridge Low Temperature Research Station work on meat is being developed along five lines: (1) the state of the water in tissues; (2) the changes in the state of the proteins during *rigor* and storage; (3) spoilage due to the action of micro-organisms; (4) chemical changes in fats; and (5) the changes in muscle pigments *post mortem*. During the past year, knowledge obtained in each of these fields of work has been of immediate value in attacking a number of applied problems. Attention has been given particularly to the possibilities of extending the life of chilled beef by storing it in atmospheres containing carbon dioxide, and the various aspects of the problem have been dealt with in a series of papers published in the "Journal of the Society of Chemical Industry." Broadly speaking, the laboratory experiments indicate that in 10 or 20 per cent. carbon dioxide the storage life of the meat is about doubled. Other problems under examination include rapid freezing, the changes during the storage of frozen meat, the storage of poultry in carbon dioxide and the ideal wrapping for foodstuffs rich in fat.

In connection with fruit and vegetables ethylene gas has been found to retard the sprouting of potatoes, and field trials are in progress to test whether this discovery can be applied to stopping the sprouting of potatoes stored in clamps during the spring. The effect of ethylene upon the carbohydrate-metabolism and respiration has been further explored. The volatile substances given off by ripe apples have been found to affect potatoes in the same way as ethylene gas. They have also been found to have other remarkable effects, *i.e.*, retarding and inhibiting the germination and growth of seeds, accelerating the ripening of apples by inducing an earlier climacteric, accelerating the ripening of tomatoes and bananas and the germination of fungal spores in water. In these effects they simulate ethylene gas. Scald in apples, of critical importance in gas storage, is also considered to be related to the accumulation of volatile substances given off by ripening fruit; it can be controlled by the presence near the fruit of mineral oils.

Mould Inhibitors

The continued study of the action of volatile substances and gases upon the growth of mould-producing fungi has shown that no simple classification of inhibitors by their action is at present possible. The use of regulated amounts of ammonia gas in the atmosphere for controlling rotting of fruits has given satisfactory results in the laboratory. Large-scale trials have been made during the year with tomatoes and oranges which have brought to light difficulties in commercial application, but these are being investigated.

The respiration, heat-production and gas-storage of bananas have also been studied, and a new method of regulating the gas-content of the storage atmosphere has been worked out and tested on a small scale. By this method, utilising the respiratory activity of the fruit, low oxygen with *low* carbon dioxide can be obtained, *i.e.*, the conditions most suitable for bananas. The study of respiration and of chemical changes in cold-stored apples and potatoes has been carried further, for there appears to accumulate at low temperatures an "inhibitor" which affects respiration and may be closely related to the cause of low-temperature breakdown, which is the most serious general limiting factor in cold-storage practice. In co-operation with the New Zealand Department of Scientific and Industrial Research, investigations have shown that a large range of varieties of apples investigated after transport will tolerate temperatures as low as 28° F. and carbon dioxide up to 10 per cent. for long periods without injury. The study of changes occurring in fruit preserved in a frozen state has also occupied considerable attention. Apples frozen and stored in air at −5° C. lose vitamin C quickly.

Canning Problems

The effect of citric acid on a considerable number of the metals used in factory equipment has been studied, together with the effect of their soluble salts on the red and purple colours of fruits. It is unfortunate that the metals of tinplate alone affected these colours adversely when present in quantities likely to be met with in fruit products. Evidence from practical tests is now available to show that the inhibitor present in beet sugar has an appreciable effect in reducing the number of hydrogen-swells with canned fruit over a given period. The inhibitor appears to be most effective with products of moderately high acidity. Results of practical interest have also been obtained in connection with the cooling of cans. Prolonged cooling in water has been shown to increase losses through fermentation, even with cans which have passed the usual tests for leaks. Experiments on the concentration and storage of orange-juice by freezing have shown that it is possible to obtain a product of excellent colour and flavour. The presence of pectic compounds, however, may cause the formation of a gel of pectic acid on standing at ordinary temperature. Freezing experiments with fruits and vegetables have confirmed and extended previous results, and have shown the possibility of establishing a new industry for frozen products.

At the Torry Research Station, Aberdeen, various problems connected with the preservation, handling and utilisation of fish are being investigated. The application of brine-freezing and low-temperature storage to long-distance steam-trawlers has developed on practical lines, and designs for plant suitable for several types of fishing vessels have been prepared for the information of the industry. The research on smoke-curing has also led to the investigation of design, and practical proposals have been made for the improvement of both kilns and methods. The study of the fats and oils of fish has been continued and extended. Besides information of medical and pharmacological value, these investigations tend to a greater understanding of the industrial possibilities of various types of fish oil. An active extract has been prepared from livers of fish for the treatment of pernicious anaemia. The sub-freezing temperature at which the rate of *post-mortem* breakdown of carbohydrate in fish muscle is at the maximum has also been ascertained, and observations on the bacterial or inhibitive effect of carbon dioxide have been made.

Grid System Refrigeration

The second season's observations in the experimental ship's hold at the Ditton Laboratory were mostly devoted to a study of the grid-system of refrigeration from the point of view of the distribution of temperature inside the stack of fruit and of the factors governing the transfer of heat from fruit to air and from air to cooling pipes. The phenomena of heat-transfer were also studied in some detail during the summer months in the empty hold, and the results were of interest as providing evidence of the mutual screening effect of ad-

jacent pipes, which has an important bearing on the question of the optimal pipe-density. Measurements of the biological constants—heat production, evaporation and gaseous exchange of the stack—have been continued Samples of fruit are being gas-stored after various periods of storage in air (during which their respiratory activity is being followed) in order to determine whether susceptibility to injury from high concentrations of carbon dioxide is related to the maturity of the fruit when it is placed in gas-storage. The uninsulated store with automatically controlled refrigeration was successfully operated with a full load of fruit, with economic results which seem to justify the further commercial exploitation of this system in simple orchard cold-stores.

Standardisation of Volumetric Glassware

The Sub-Committee of the Dairy Research Committee which is dealing with this question has continued its work during the year and good progress has been made. The sub-committee has completed its draft standard specifications for glassware used in the Gerber, Babcock and Leffmann-Beam tests, and also its draft standard directions for determining the percentage of fat in milk and milk products using the proposed standard apparatus. Sample apparatus for the Gerber and Babcock methods, made in accordance with the proposed standard specifications, has been obtained, tested at the National Physical Laboratory for conformity with the specifications, and distributed to certain members of the sub-committee for trial and comparison with a gravimetric method. These trials involve a large amount of experimental work and are not yet quite complete; results so far available are, however, very promising.

In addition to the determination of the percentage of fat in cream and cheese with special Gerber butyrometers designed for this purpose the sub-committee is trying out alternative methods employing the ordinary Gerber milk butyrometer. Preliminary consideration has also been given to the preparation of a standard specification for a lactometer. Examination of a number of typical lactometers in current use has shown that, for most of them, the changes in their readings occasioned by changes of surface tension are incompatible with the degree of accuracy required of the instruments. The sub-committee therefore hopes to proceed in the near future with the design of a standard lactometer paying due attention to surface tension effects.

Fumigation of Stored Products

For stored products research the Board has continued its support of the Biological Field Station at Slough, whose work is directed against the insects and fungi which infest stored products. The chemical work has been concerned mainly with the study of fumigation problems. Present day fumigation practice is unsatisfactory because too little attention has been given to the kind of insect material used in experimental tests on fumigants and because no serious attempt has been made to study the behaviour of gases during the actual process of fumigation. With regard to the first question, an extensive series of tests has been made both in the laboratory and in the course of commercial fumigation. These tests show that temperature has a very important effect on the resistance of insects to fumigants and that the variation in resistance to fumigants by different species of insects and by insects in different stages of development is much more important than has been supposed.

Work on the behaviour of gases during fumigation has made good progress. An improved method for the measurement of gas concentrations for the control of fumigation has been devised and standardised and has been found entirely satisfactory in practice. The use of this apparatus has yielded valuable data regarding the behaviour of gases during fumigation and its use, in combination with test-insects, enables the efficiency of fumigation to be readily ascertained. An important branch of fumigation work is the determination of the gases both in air-spaces and in foodstuffs, and work has been begun on the fumigants ethylene oxide and hydrocyanic acid gas. The work on hydrocyanic acid gas is not yet completed but improved methods of determining ethylene oxide have been devised.

Experimental trials with tung trees, initiated during the past four years by the Imperial Institute Sub-Committee on Tung Oil, in collaboration with the Royal Botanic Gardens, Kew, and the Research Association of British Paint, Colour and Varnish Manufacturers, are still in progress and as a result information is being obtained in regard to those parts of the Empire which are most suitable for the cultivation of this crop. So far the most promising results have been obtained in Burma and Assam. In an increasing number of countries the trees have commenced to bear fruit. Samples of tung nuts or oil from Assam, Bihar and Orissa, Ceylon, Nyasaland, Kenya, Natal and New Zealand have been examined and compared with the products from China and the United States, and the results indicate that it is possible to produce in the Empire tung oil of satisfactory quality.

The Paint Research Association has also been carrying out investigations on various problems relating to the production of tung oil. Besides examining samples from Empire sources the association has conducted research on the preparation of the oil and, in co-operation with one of the large firms of oil-crushers, has investigated the respective merits of the expression and extraction processes.

Lac Marketing

In India, work at the Lac Research Institute at Ranchi is concerned primarily with fundamental questions such as the life history of the lac insect, its insect enemies, the bionomics and the biochemical problems surrounding the insect itself and the host trees on which it feeds and the production and preliminary treatment of sticklac, seed-lac and shellac. In Europe, the International Electro-technical Commission of 1930 through its Advisory Committee on lac is preparing an international specification for buying lac for the electrical industries, the British National Committee of the commission being the British Standards Institution. Mr. A. J. Gibson is chairman of the above advisory committee, and also of the Lac Sub-Committee which was appointed in 1931 by the Imperial Institute Committee on Essential Oils and Resins

Throughout the period during which the Empire Marketing Board inquiry has been in progress, lac, like other tropical products, has suffered from the continual fall in the general price level. This, however, is not an unmixed evil, as lac products are thus available at prices which make it possible for them to compete on level terms with " synthetic " or substitute resins. Much work has still to be done in applied research on lac to improve present uses and processes and to find new uses. In order to maintain its position in the industries consuming natural and synthetic resins, lac must be freed from some of its present limitations, such as for instance low resistance to softening and deformation at temperatures met with in modern industrial practice, lack of resistance to water and water absorption, and the unstable properties of bleached lac. Experimental work so far done shows that lac mouldings can be made to resist temperatures up to 140° C., that de-waxed lac has a promising future in varnishes and polishes in combination with cellulose lacquers and that the problems of the oil-solubility of lac and of the esterification of lac are capable of solution.

Shellac v. Synthetic Resins

The Indian Lac Cess Committee is now fully aware of the difficulties surrounding the use of shellac in modern industry and is at present considering a scheme of research whereby three Indian chemists will be attached to applied research laboratories in the United Kingdom to study and elucidate the trade problems which will be put before them by the lac marketing officer. In India, as a preliminary to compiling and publishing exact data on the physical, chemical and mechanical properties of shellac—a very large problem, a solution of which would be of great assistance to practical applied research in this country—the determination of the physico-chemical constants of sticklac, host by host, district by district and crop by crop has to be taken in hand.

Given a continuous and progressive policy of research, both in the fundamental and in the applied research problems surrounding the utilisation of lac, and, of course, stability of price on a competitive basis with the synthetic resins, there is no reason to doubt that lac will not only retain the position it has held so long in the markets of the world as a sound varnish and plastics material, but will also extend its scope and its uses and will be able to compete with its synthetic rivals on equal terms.

Patents as Industrial Property

The Importance of Enlisting Expert Aid in Patent Matters

THE introduction of the new Patents and Designs Act, in November, 1932, is sufficient reason for reminding readers of THE CHEMICAL AGE of the ever-increasing part played by patents as a form of protection for industrial property. These notes are taken from the new 19th edition of the brochure on Patents and Trade Marks, published by Kings Patent Agency, Ltd., of which Mr. Benj. T. King is managing director.

WHEN an inventor has obtained letters patent, and the specification and claims upon which the grant is made are sound and valid, he possesses a property of more or less commercial value, which is capable of realisation by assignment, licence, or manufacture, exactly as house or land property may be realised by lease, sale, mortgage or personal occupation. But in both cases the title deeds must be sound and valid, or the property is valueless. A faulty patent, which may be based on bad claims, statutory reference, or a badly worded or drawn specification or, in fact, a patent possessing any of the numerous loopholes for infringment, may jeopardise the whole future of a brilliant invention. It must be borne in mind that once the application is lodged with the Comptroller, substantial additions are not permissible, and even if an inventor, inexperienced in patenting, eventually succeeds in overcoming the Comptroller's objections and obtains the acceptance of the patent application, he may subsequently learn that the resulting title deed, in the form of the letters patent, after being subjected to criticism, reveals a weakness or fault which is difficult, if not impossible, to make good.

Novelty in Chemical Processes

The validity of the patent and the legal aspect, however, are only half of the battle. In this sense practitioners and patent experts may very likely throw cold water on a project with minds only for the strength of the possible patent, but the inventor should temper such opinions with commercial considerations. A deep-rooted conviction on marketable merits is not lightly to be cast aside. The word "patent" is magic, quite apart from the legal protection afforded. To the lay mind, it connotes protection and monoply, a "novelty," a proprietary line, and a success; there is value even in a "paper" patent, which may be granted on negligible trivialities, and which never would or could be sued on.

In the case of inventions relating to substances prepared or produced by chemical processes, or intended for food or medicine, a patent will not be granted for the substance itself except when produced by the methods or processes described or by their obvious chemical equivalents. In other words, it is primarily the process that is patentable, and the substance is only monopolised by the patentee if it happens to have been produced by his particular method. Accordingly it follows that the process itself must essentially be new and original, and a real invention. As an example, let us assume milk in the form of a powder to be new; merely as a new form of milk, however, it is not patentable. But a process of spraying milk on to a hot cylinder at a certain temperature, drawing off the steam by a vacuum fan, and then scraping the solidified milk from the cylinder to form powder, would be patentable. Consequently the patentee could claim as his patent any milk powder when produced by his new way, but could not restrain others preparing it in any other way, although (according to our assumption) he was the first to invent milk powder. The mere admixture of ingredients for foods or medicines is not a patentable process, because obviously the process of admixture is not new and special, or "an invention."

Employees' Inventions

It is an established fact that the otherwise good relations existing between employer and employee are often seriously affected by questions concerning the inventions of an employee. Although no hard and fast rules can be laid down, as the circumstances governing different cases vary considerably, and each has to be judged on its own merits, there is little doubt that an ordinary rank-and-file workman operating machinery, building or assembling, packing or otherwise carrying out manual work, bargains only to give certain hours at a specified job for a certain wage and is at liberty to invent anything as his own property, and the employer has no claim to it. In this connection the somewhat classical utterance of the Solicitor-General (in *re* Heald's patent) is of interest: "I am not aware of any authority which lays it down that the invention of a servant, even made in the employer's time, and with the use of the employer's materials, and at the expense of the employer, thereby becomes the property of the employer, so as to prevent the person employed from taking out a patent for it."

A sharp line must be drawn, however, in cases where a principal has suggested the main idea to subordinates, with sketches, etc., for them to work out practical details. This working out might conceivably require great skill and even inventive ability. Even so, the master is employing the servant for the set purpose, and is generally directing, so the workman cannot claim an interest in the patent.

Joint Patents

True, the workman's improvements in mechanical details may rise to such overshadowing heights, that he is entitled to certain benefits, but it is practically impossible to define when such rights begin. It all depends upon what actually is the pith of the invention—the main idea, or the method of carrying it out. In a decided case it was stated: "It would be difficult to define how far the suggestions of a workman employed in the construction of a machine are to be considered as distinct inventions by him, so as to avoid a patent incorporating them taken out by his employer. Each case must depend on its own merits. But when we see that the principle and object of the invention are complete without it, I think it is too much that a suggestion of a workman employed in the course of the experiments, of some thing calculated more easily to carry into effect the conceptions of the inventor, should render the whole patent void."

In another case the judge directed the jury thus:—"I take the law to be that, if a person has discovered an improved principle, and employs engineers, agents, or other people to assist him in carrying out that principle and they in the course of experiments arising from that employment make valuable discoveries accessory to the main principle, and tending to carry that out in a better manner, such improvements are the property of the inventor of the original improved principle, and may be embodied in his patent, and if so embodied the patent is not avoided by evidence that the servant or agent made the suggestion of the subordinate improvement of the primary and improved principle." Higher employees—manager, chief engineer, head draughtsman, and so forth—enjoy relations which are close and more confidential, and it may not be equitable to allow such an employee to retain the benefit of the invention. The facts must be sifted thoroughly, but in all probability the balance will be with the employer. It is, in nearly every case, fairer to patent the invention jointly.

Employing an Agent

The inventor's main difficulty arises at the initial stage, and this is the problem of efficiently protecting the invention against unscrupulous infringers. In this respect, application for a patent immediately suggests itself, and it is here that the inventor is only too frequently led astray. In order to protect an invention with a view to ensuring its ultimate commercial success, it is absolutely necessary to secure the grant of a valid, sound and marketable patent, from legal, scientific and commercial points of view, and it is at this point that a qualified practitioner should be consulted with reference to the merits of the invention, for large numbers of patent applicants learn too late that they have been going to useless expense in their endeavours to obtain what investigation subsequently proves to be a patent lacking in subject matter or worthless through want of novelty. It therefore behoves an inventor at this initial stage of filing the Patent application, and certainly before acceptance, to employ the services of an agent who is skilled in settling the specifica-

tion and claims, and who is capable and proficient in putting the whole matter into proper and legal order.

Inventors, as a class, usually possess very vague ideas as to the information to be laid before their patent agents, and how to do it. Prospective patentees should bear in mind that the specification for a patent must disclose everything; if an essential feature is purposely held back, the patent may be invalid. Full confidence in the patent agent is also essential; he should be provided with the fullest possible information and given reasonable time in which to draw up the documents embodying such information. Models are generally unnecessary, but if there is one it "tells the tale" to the agent better than reams of description; rough sketches are also welcome. The agent should also be informed of the nearest processes or appliances known to the inventor (as compared with his own new proposal), and the relative advantages and disadvantages pointed out. It will help him to decide on the scope of the invention and enable him to draft the specification accordingly.

Opposition to Grant of Patent

It is when the complete specification has been lodged, and the application has passed through all the official routine and investigations, and the examiner is satisfied that the invention claimed is new and original, that an opportunity is given the general public to oppose the grant of the patent on certain specified grounds. To this end, after the official acceptance of the complete specification has been advertised an opposition period of two months must elapse before the patent can be "sealed," *i.e.*, granted or issued. The time for opposition may be increased by one month provided that application be made within the normal two months opposition period. The main ground of opposition, which mostly arises, is one alleging that the invention has been previously "published." If the opponent knows of one or more British patent specifications not more than 50 years old, which were published before the applicant's case was applied for, and which contain a description of the invention in question, he can use this fact as a ground of opposition. Under this ground, also, foreign patent specifications and literature, and also British text-books and general literature may be used, but always providing they were made available to the public prior to the application under opposition, such as by being shelved in a public library. The opponent must, of course, have some definite "interest" in the matter.

Other grounds of opposition exist which are of a more technical character (*e.g.*, dealing with the clashing of application dates in co-pending cases where a prior applicant—the opponent—has claimed the same invention), and these need very careful consideration before launching on comparatively expensive opposition proceedings. An opponent can also object on the ground that the applicant obtained the invention from him, but he should be prepared to adduce very strong evidence and corroboration to support his allegations. The fact that an invention has been *previously made and sold* cannot be used as a basis of opposition proceedings, although such a state of affairs could be pleaded in defence to infringement proceedings in the Courts. But arising from such manufacture and sale, any published descriptions advertisements, circulars, and so forth, distributed before the date of the patent application could be used as a ground of opposition at the Patent Office.

Value of Protection Abroad

Within certain time limits the foregoing opposition procedure and grounds can be applied to the revocation of a patent already granted. A patent can also be attacked by means of another revocation procedure based on "abuse of monopoly rights," under which is included non-working within the prescribed period of three years from date of grant; not meeting the demand for the patented article to an adequate extent and on reasonable terms; prejudicing the trade or industry of the United Kingdom by reason of the refusal to grant licences on reasonable terms, and so forth.

Very few inventors give sufficient thought to the question of obtaining protection abroad, although the value of a good British patent is greatly enhanced by the holding of foreign rights, which constitute realisable assets when the goodwill of the invention as a proprietary investment is taken into consideration. Many inventors fail to realise the importance of securing their rights abroad, where, unless they do so, others may steal a march and forestall them, and though they may ultimately assert their rights, the expenses incidental to such litigation puts this procedure out of the question, and consequently the Foreign rights are lost. In many instances, specialised inventions, owing to centralised demand, render foreign patents of more value than that of the United Kingdom. The International Convention is an arrangement between the principal powers, whereby an inventor is afforded priority of the date of his home patent application, providing he applies abroad before the expiry of twelve months from the home date. In such a case he is entitled to have his foreign patent ante-dated to the date of his home application. Most of our Colonies have also entered into an arrangement to the same effect, if they are not parties to the International Convention.

The Convention Period

There are countries, however, where publication by the acceptance of the British complete specification is fatal to the grant of a patent in such foreign country, and cases frequently arise where the inventor has not only allowed the twelve months "convention" period to elapse without taking advantage of such priority, but where other people have stepped in sometimes innocently, and have patented such protected inventions in other countries. Even if no one else has intervened, in most countries it is impossible to get a valid patent after the expiry of the twelve months period if publication has taken place. Publication abroad quickly follows the acceptance of the British complete specification and, apart from this, the inventor himself often prematurely makes the invention known. The inventor should, therefore, as soon as possible after the British provisional application is accepted, complete the application so that immediately the result of the fifty years official report on novelty by the British Patent Office is known (or before, if the twelve months are nearing expiry), the matter of foreign rights can be considered and steps taken to protect the invention in all foreign countries where a monopoly to make and sell is desired.

Encouragement to Younger Men

General Sales Manager and Director at 37

REFERENCE was made at a luncheon at which the Anglo-American Oil Co. entertained at the Royal Hotel, Plymouth, a number of business men, motorists and motor agents, on August 4, to the success achieved in the oil industry by a young Exeter man. Mr. L. Sinclair, the company's sales manager for the West of England, mentioned that Mr. E. E. Soubrey, manager for a considerable time at Exeter and the surrounding district, was the previous day appointed a director of the company, a fact which should be an encouragement to all young men. Mr. Soubrey started with the company as a junior clerk, passing from office to office until, at the age of thirty-seven, he had been appointed general sales manager and a director of one of the leading companies in the country.

The luncheon was in connection with an exhibition which the company is holding of the hydrogenation process. In opening the exhibition Mr. P. G. A. Smith, the company's advertising manager, said that in the perfect lubricant there were five main qualities to ensure perfect work. These were ability to flow easily when cold, "body," economical consumption, slow carbon constituent and long life. By means of the hydrogenation process all these qualities had been combined to a fair degree, and Essolube was the result. Motorists were among the first to benefit from the application of the process which won the Nobel Prize. Referring to the system of distribution which had been introduced simultaneously with the initial production of Essolube, Mr. Smith said the sealed bottle containers, abolished the old methods and protected the oil from dangerous pollution by dust and damp. In addition to being more attractive and convenient the method was actually more economical than the older system. The motorist could fill his car with oil without soiling his hands, and because of the viscosity of Essolube the damage done to motor bearings when starting from cold was to a great extent eliminated.

Economic Crisis in Czechoslovakia

British Trade Openings

ECONOMIC developments in 1932 have severely tested the nerves of the Republic and anxiety for the economic welfare of the State has taken the place of complacency, states a report on the economic conditions in Czechoslovakia issued by the Department of Overseas Trade (H.M. Stationery Office, price 2s.). One of the main problems has been to harmonise the several claims of the agrarian and industrial elements. The decline in world trade reacts with peculiar hardships on a country which, in the absence of invisible export revenue, is vitally dependent on the exports of industrial and agricultural products. The existence of so many trade restrictions in foreign countries has seriously reduced Czechoslovakia's export trade and has forced her, in order to maintain financial stability, to impose a large number of restrictions which are not in harmony with her economic structure. For the first time for many years foreign trade showed an adverse balance in 1932.

Metallurgical Industry

The plight of the metallurgical industry is seen from the fact that production, which in 1929/30 amounted to about 2,000,000 metric tons of crude steel and 1,645,000 metric tons of pig iron, is estimated to have reached only about 580,000 tons of the former and 380,000 tons of the latter during 1932. In three years, therefore, the total output fell by approximately 75 per cent. Conditions for the rolling-mills are even worse inasmuch as, in their case, production fell during the same period from 400,000 to 50,000 tons, and this notwithstanding producers' bonuses which are granted to the rolling-mills to encourage export trade.

The situation is difficult for all branches of Czechoslovak industry but none has suffered more than the metallurgical industry. The difficulties are the same as those which now beset all manufacturing activities, but they fall more heavily on the iron and steel works, as certain inherent weaknesses which the present depression is everywhere bringing to light are, in their case, still more highly pronounced; namely, in swollen productive capacity and consequent dependence on export business. The Czechoslovak iron and steel works have sunk very large amounts of capital during recent years in extending and modernising plant with the object of rendering themselves more competitive in world markets, and the large scale production necessitated by this policy of expansion continuously requires, for reasons of costing, a much larger output than the works are now able to dispose of. Another factor is that in favouring a policy of relatively high internal prices and concentating on export, producers have handicapped themselves in the domestic market, which continues to be of relatively small account as a potential consumer of iron and steel goods. Consequently, with export markets now virtually closed, either as the result of tariffs or foreign exchange regulations, manufacturers are hard put to it to cover ordinary charges, whilst profits are difficult to earn in present circumstances.

Plants Closed Down

In an effort to alleviate these conditions certain plants were closed down entirely during 1932 and production centralised at other works, agreement to this end having been facilitated through the agency of the cartel which binds the sales organisations of the Czechoslovak works. Three more furnaces were damped down during 1932, and of a total of 27 for the whole country only 5 were in blast at the beginning of 1933. At the leading works, including Poldi, the Prague Iron Works and the extensive Ceskomoravska and Skoda concerns greatly reduced their pay-roll during the past year, and the process of contraction does not yet appear to have ceased. Some Russian orders for tubes and rolling-mill products were booked early in 1933 with the assistance of the State Export Credits scheme. but the amount of Russian business on hand is much less as compared with previous years. One of the leading producers of motor cars ceased production entirely in 1933.

The tanning industry has fallen into such a state of inactivity as to make further stagnation almost inconceivable. Normally Czechoslovakia is obliged to supplement local supplies by purchases abroad of large quantities of glove skins, sheep skins and hides for the preparation of upper and sole leather. These surplus requirements necessitated, until the middle of 1931, imports at the rate of about 200 wagons monthly, but by the early part of 1932 the trade had receded the level of 100 wagons. Subsequently the position was reversed and Czechoslovakia is now exporting considerable quantities of domestic hides which are normally tanned by the home industry. The price of leather steadily decreased. Tanned cowhides which at the beginning of 1932 were quoted at about 8s. 3d. per kilo were offered at 6s. 6d. by the end of the year. The total import of tanned leather amounted to only 70 tons in 1932 against 1,400 tons in the previous year, whilst exports from Czechoslovakia tanneries declined from 1,310 tons to 130 tons in the same period.

Sugar Production

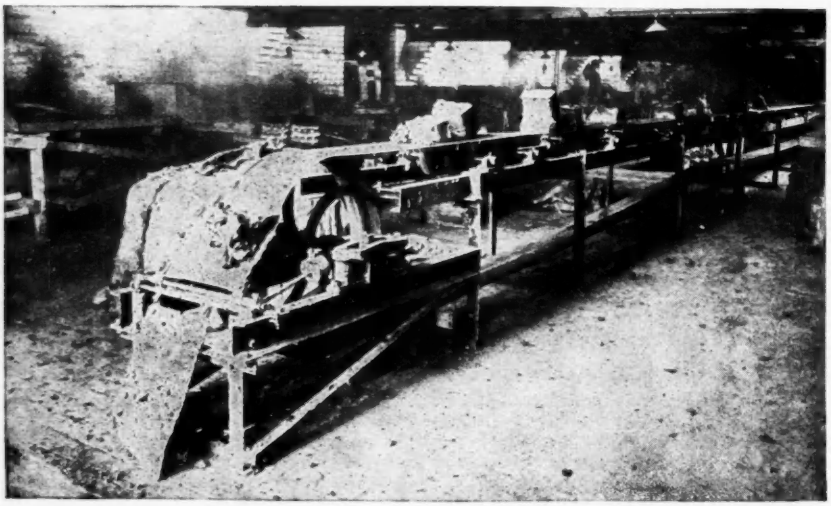
The beet crop for the year 1931/32 was as follows:—Area planted 179,168 hectares, beet worked 44,290,178 quintals, sugar produced 8,144,163 quintals, sugar exported 5,051,172 quintals, home consumption 3,957,181 quintals. Czechoslovakia's export quota under the Chadbourne plan was 5,817,770 quintals for 1931/32 (raw value). On the basis of the ratio 9.10 for conversion of raw into refined, as provided by the International Sugar Agreement, the export quota has been exhausted to the extent of 4,930,130 quintals (84.74 per cent.), leaving an exportable margin of 887,640 quintals (15.26 per cent.). The crop year for 1932/33 was as follows:—Area planted 138,248 hectares, beet worked 35,961,333 quintals, sugar produced 6,300,915 quintals. From this crop year the following quantities are expected to be available: Stock from 1931/32, 1,467,421 quintals, January crop forecast, 6,300,915 quintals, making a total of 7,768,336 quintals; estimated home consumption (including distilleries and yeast-factories) 4,288,145 quintals, leaving an exportable quantity of 3,480,191 quintals, the Czechoslovak export quota for 1932/33 being 5,708,170 quintals. It would therefore appear that for 1932/33 the Czechoslovak industry will be short of about 2¼ million qintals for export under the quota, and that at best only about 60 per cent. of the total quota will be available. The 1933/34 area under sugar beet in Czechoslovakia will be about the same as in 1932/33, so that if a normal crop is secured the approaching campaign may yield about 7,000,000 quintals (raw sugar value). The actual sugar yield of the 1932/33 crop was very moderate owing mainly to a partial crop failure in some beet growing districts.

Decrease in Rubber Imports

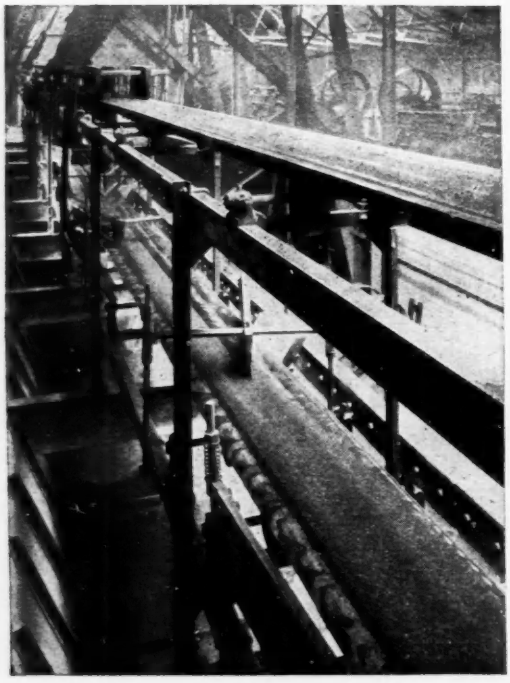
The Czechoslovak rubber industry is comparatively new. Only four concerns of any importance existed before 1914 in the territory that now forms the Republic, but those factories have been extended and others established. Close on 5,000 workers are now employed in this branch. At first restricted to small articles for the retail trade, such as household, surgical and technical goods, the industry gradually extended its scope, and strenuous efforts are now being made to increase the home manufacure of motor car and bicycle tyres, to such an extent as eventually to cover the entire demand for those commodities. There has consequently been a steady decline in imports, especially of bicycle tyres. A similar tendency is noticeable as regards motor tyres though the decline in imports has in this case not been so striking owing to the constant increase in the use of motor vehicles shown by the local tyre-making industry. A price cartel binds the manufacturers and distributors. The oldest factory is the "Semperit" concern, associated with the Austrian Semperit-Reithoffer undertaking, and their production in 1931 was put at 600 tons. This represents about 15 per cent of the whole tyre consumption—say 4,400 tons—which compares with a total import of 3,546 tons of pneumatic tyres during the same year, in addition to those fitted to cars at the time of import. The second Czechoslovak tyre factory (Kudrnac of Nachod) began operations early in 1932, and at the beginning of 1933 negotiations were finally completed for the formation of a new undertaking, the French Michelin concern, after competition with other groups, having obtained permission to erect a pneumatic tyre factory near Prague.

The Mechanical Handling of Raw Materials

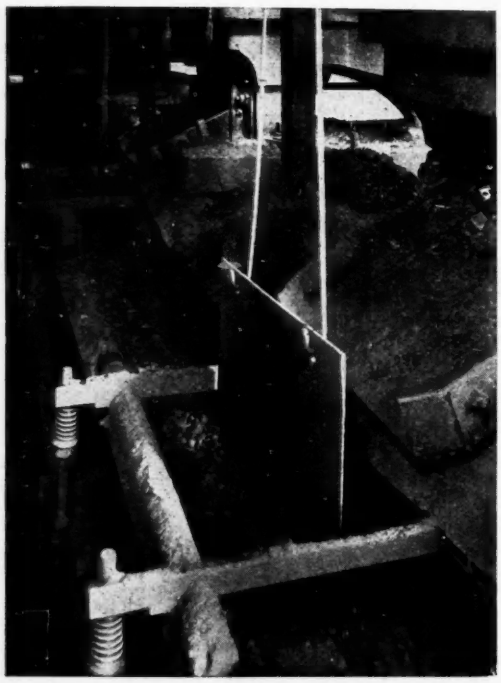
Modern Conveyor Installations with Novel Features



At clay product works, slabs of clay from the pug mill are loaded on to the travelling band at the driving terminal and removed as and where required by boys, who deliver to brick and tile makers situated on opposite sides of the conveyor. Slabs of clay not removed are discharged over the terminal shown in the accompanying illustration.

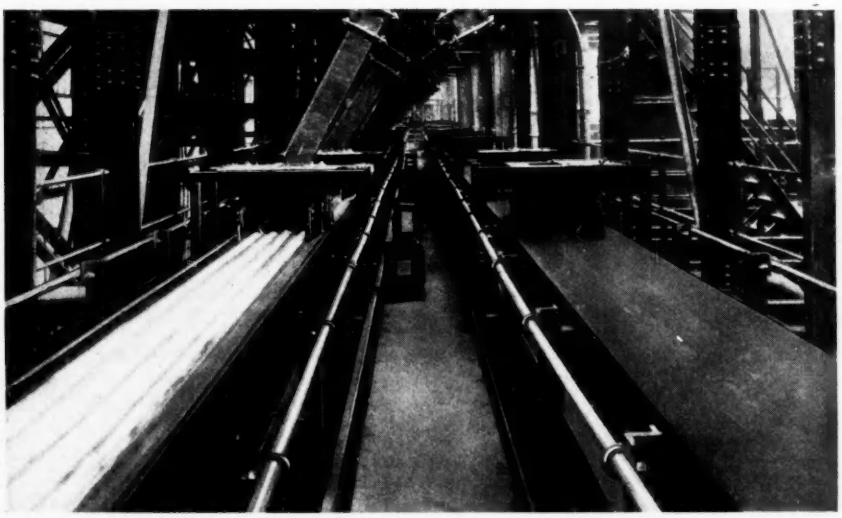


Left : A conveyor installation for receiving, mixing and distributing ground shale. The shale is received from two elevators by the top strand, mixed and conveyed to one terminal, where it is transferred to the bottom strand by a V-plough and hopper, and is then discharged by right and left hand adjustable radius ploughs to press hoppers which feed the brick-making presses.

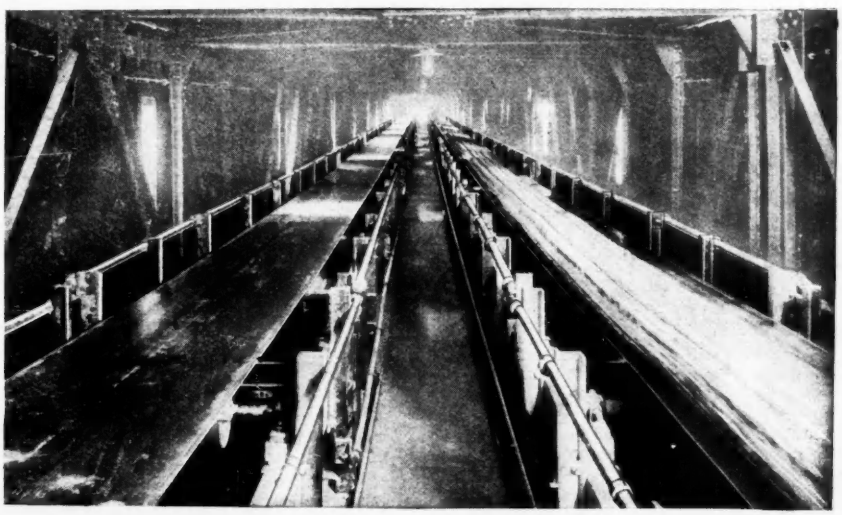


Right : Crushed stone from crushers and granulators is delivered to an elevator feeding the storage dump at a modern quarry. Here swinging baffles arrest impetus of delivery. This view, looking towards the driving terminal, shows the delivery chutes leading from the crushers.

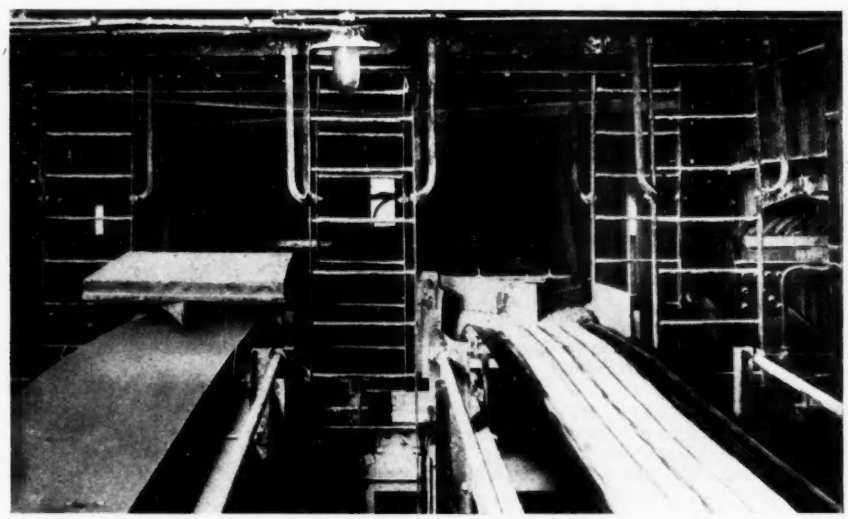
Photographs by courtesy of The Steel Band Conveyor and Engineering Co., Ltd.



Dry aerated ground anhydrite, at a temperature of 150° F., is received from main and auxiliary cyclones by way of breeches chutes into de-aerating and air-releasing loading hoppers, by two conveyors running side by side, with gangway between. This view, looking towards the tension terminal, shows the breeches chutes and loading hoppers.



Another view of the preceding installation for handling ground anhydrite, taken from the position of the breeches chutes and looking towards the incline which is 3° per 24 feet. These conveyors transfer the anhydrite to other conveyors running at right angles, and are so arranged that one or both longitudinal conveyors can transfer to one or both of the transverse conveyors.



A further view of the same installation, showing one of the unloading points where the longitudinal conveyors transfer the ground anhydrite to one of the transverse conveyors. A second set of unloading points, with V-ploughs, is faintly visible in the background.

Letters to the Editor

The Editor welcomes expression of opinion and fact from responsible persons for publication in these columns. Signed letters are, of course, preferred, but where a desire for anonymity is indicated this will invariably be respected. From time to time letters containing useful ideas and suggestions have been received, signed with a nom-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE unless its authorship is revealed to the Editor.

Methyl Bromide as Fire Extinguisher

SIR,—We have been strong advocates for the use of methyl bromide in fire extinguishing and, working under the patents of our managing director, we have now put a small self-spraying extinguisher on the market. This type of extinguisher, which combines several attractive features, has been tested on all kinds of fire, and the liquid has proved itself a most valuable product. Using small hand extinguishers only, three operators extinguished a test fire in 1 minute 20 seconds. The fire consisted of the Royal Air Force mock crashed aeroplane, of dimensions approximately 30 ft. by 30 ft., saturated with petrol and having petrol pumped on to it at the rate of 15 gal. per minute.

Much has been said concerning the toxic nature of methyl bromide but there are very few facts, and these of foreign origin only, to substantiate these statements, and the so-called tests quoted have no bearing whatever on fire extinguishing and to any impartial judgment cannot be taken as indications that methyl bromide is dangerous to use as a fire extinguisher. Quantities of methyl bromide have been deliberately and accidentally spilt in confined spaces by us without any bad effects on the people. During the manufacture and handling we have not met with a single untoward happening. The safety and harmlessness of other products used in fire extinguishing such as carbon tetrachloride could be similarly questioned if we were desirous of provoking controversy but such is not our desire.—Yours faithfully,

HEDLEY AND CO. (LEYTONSTONE), LTD.,
ALBERT HENNING,
Chairman and Managing Director.

120-122 Harrow Road,
Leytonstone, E.11.

Tin and Zinc in Corrosion Problems

SIR,—In the Metallurgical Section of THE CHEMICAL AGE, August 5, page 193, it is stated that "tin has one great disadvantage as a metal, for it is lower in the electromotive series than iron, and theoretically when its surface is broken so that both metals are in contact with a conducting solution, the tin stimulates corrosion."

The belief that a coating of a cathodic metal must always, according to electrochemical theory, "stimulate" corrosion at breaks in the coat is widespread, and, since the matter is important, perhaps you will allow me once more to point out that this stimulation will not necessarily occur. The question of tin coats is complicated because, as you correctly point out, tin is sometimes cathodic and sometimes anodic towards iron. To simplify the position let us consider a coating of a definitely cathodic metal, such as nickel, containing a narrow pore which exposes the iron. The intensity of corrosion of the iron will be determined by the density of the current flowing between iron and the *outside* of the nickel coat (where oxygen, necessary for depolarisation, is available). Will this current density be greater or less than that on bare iron, where the corrosion-current will flow between anodic and cathodic parts of the same metal? Quite often the E.M.F. of the iron-nickel cell may be greater than that of the iron-iron cell (although surprisingly high E.M.F. may be set up between different parts of the *same* metal by local differences in the liquid); but the effect of the path resistance will usually be higher in the case of a pore threading a nickel coat (especially if the coat is reasonably thick), and in general we may expect the local corrosion-intensity at the faultily nickel-plated surface to be less than that of a bare iron surface. This is, of course, borne out by experience. A faultily-plated cycle part undoubtedly allows some corrosion, but usually suffers less than iron completely unprotected. Surely no one would assert that nickel plating, unless it is quite perfect, is actually worse than useless?

Some years ago ("J. Inst. Met.," 1928, *40*, 100, 112) I endeavoured to realise the intensification of corrosion of steel at a break in a cathodic coat, and, in a favourable case, I obtained it. Strips of copper-coated steel were bent sharply to break the coat and exposed to a moist atmosphere rich in hydrogen chloride. The attack on the steel at the break was locally far more intense than that on similar steel uncoated with copper. But this intensification at a break was on the whole rather exceptional. Broken coats of nickel never gave any marked intensification of attack, the E.M.F. of the cell iron-nickel being much lower than that of the cell iron-copper. Experiment, therefore, bears out the prediction of theory that stimulation of attack by a faulty coat is possible in certain cases, but will not occur in all.

The question of zinc is also discussed in your interesting article. It is stated that "its position in the electromotive series with reference to other metals, particularly iron, is very favourable." I am sure, however, that you would be the first to agree that the electromotive series does not constitute an order of merit; if it did, then coatings of potassium should be superior to all others! Actually a layer of potassium should give splendid protection as long as it lasts, but clearly its life will be short. In choosing a metal intended to give cathodic protection at breaks in the coat, it is necessary to ensure a sufficient current density on the exposed iron, but also to ensure that the coating metal which "sacrifices" itself to protect the iron does not sacrifice itself more rapidly than is absolutely necessary; for as soon as the anodic metal has disappeared, corrosion of the iron must needs commence. The position is complicated by the fact that films of adherent compounds, which (as you point out) increase the life of the covering metal, may sometimes interfere with the cathodic protection of the exposed iron.

I have discussed these matters elsewhere ("J. Electroplaters and Depositors Tech. Soc.", 1928, *4*, 74; 1930, *6*, 153. "J. Inst. Met.", 1928, *40*, 113. "Trans. Electrochem. Soc,", 1930, *58*, 35), using the principles to explain why aluminium coats, which in chloride solution give more lasting protection to iron than zinc coats, are definitely worse than zinc coats in some hard fresh waters, at least if there is a danger of a break in the coat.—Yours faithfully,

ULICK R. EVANS.

University Metallurgical Laboratory,
Cambridge.

Intensive Cultivation of Fodder

Experiments at Reading

A NEW system of chemical cultivation is being demonstrated at the National Institute for Research in Dairying at Shinfield, near Reading. It is claimed by the inventor, Dr. Spangenberg, that all kinds of crops grown from seed—such as maize, oats, barley, soya beans, cotton, rice and ordinary grass—can be grown in ten days to the same extent as would normally require two to three months. The seeds are sown in trays in an airtight cabinet from which light is excluded and are treated with considerable quantities of water containing chemicals. At the end of ten days each tray contains a closely-packed growth of the particular crop, approximately 13 in. to 16 in. high. The crop can then be removed from the tray and used immediately as food for animals or human beings.

The crop is said to be succulent and particularly suitable for the feeding of cattle, and it is claimed that the vitamin content is considerably higher than that of crops produced under natural conditions. Further, the crop is much thicker than the normal growth, in that there are approximately five times the number of stems per unit area. It is possible to feed cattle all the year round with fresh green fodder instead of hay and other dried foodstuffs normally used during the winter months. A certain amount of dried fodder should be added during the whole of the year owing to the richness of this artificially-produced fodder. By this process cattle-rearing, it is claimed, is made independent of climatic conditions and can be carried on either in town or country under tropical conditions or in the cold countries of the North.

Chemical Notes from Overseas

Canadian Imports of Explosives

DURING the fiscal year ended March 31, 1933, the total Canadian imports of explosives declined to a value of £41,766 compared to £70,759 in the 1931-32 fiscal year. The United Kingdom accounted for £8,131 in the 1931-32 year compared to £3,374 in the 1932-33 year, respectively.

Sulphuric Acid Production in Canada

PRODUCTION of sulphuric acid in Canada in 1932 totalled 136,846 tons, 66° Bé, as compared with 119,541 tons in 1931. Of this total about 57,390 tons, valued at $759,553, were intended for sale and 79,473 tons, valued at $151,651, were for use in the producers' own acid plants or associated works. Production of ammonium sulphate during 1932 amounted to 57,770 tons, valued at $983,077, which was a gain of 104 per cent. in quantity and 39 per cent. in value as compared with the previous year.

Imports of Bleaching Powder in India

INDIA'S bleaching powder imports in the year ending March 31, 1932, increased to 6,446 long tons compared with 5,950 tons in the preceding year. India is one of the six largest importers of this product. By comparison with the fiscal year 1926-27, when about 4,000 long tons were imported, this represents a substantial growth. In the nine months ending December, 1932, imports of 6,176 long tons indicate a further increase, for in the same period of the previous year the quantity was only about 4,900 long tons. The source of this product in 1930-31 was chiefly Great Britain (4,139 long tons).

Japan to Produce Ammonium Chloride

THE SUMITOMO FERTILISER CO. has announced that it is building a plant for the production of chloride of ammonia, and that this chemical will be marketed by them beginning October 1, 1933. It is anticipated that about 700 or 800 tons will be produced during the first half year of operation. Estimates of the present consumption of chloride of ammonia in Japan approximate 3,000 tons per year. Imports of chloride of ammonia into Japan from Great Britain during 1931 amounted to 25,495 piculs, out of a total of 37,102 piculs. Total imports in 1932 amounted to 30,143 piculs, and during the first three months of 1933, 6,612 piculs.

Japanese Benzol Output

JAPANESE production of benzol during 1932 is estimated at approximately 20,000 metric tons, compared to 12,556 metric tons in 1931 and 16,209 metric tons in 1930. The Yawata Steel Works, at present the largest benzol producers, are expected to increase their annual output to 12,000 tons and other steel, coke and gas companies in Manchuria and Chosen as well as Japan proper are also reported to contemplate a larger benzol output. There was, however, a scarcity of benzol for the manufacture of dyestuffs due largely to the demand for benzol in the manufacture of military raw materials.

Increase of Rhodesian Imports

ACCORDING to the Economic and Statistical Bulletin of Southern Rhodesia, the total value of imports during the first quarters of the current year was 1,088,000, as compared with £1,056,000 in the March quarter of 1932, an increase of £32,000 or 3 per cent. The total imports of drugs and chemicals, etc., during the first quarter of 1933 was £65,116, as compared with £57,760 of last year. The United Kingdom was the chief source of Rhodesian imports, the total for January-March, 1933, being £497,189. Imports of oils, waxes, resins and paints amounted to £60,158, and exports amounted to £25,064 during the same period both these figures being less than in 1932. Exports to the United Kingdom, amounting to £632,140, showed an increase of £34,660 over 1932, whereas exports to the Union of South Africa and Northern Rhodesia fell by £14,296 and £16,975 respectively. The value of exports to the United States and other foreign countries fell appreciably. Exports to all British countries amount to £728,249 in 1933 and £723,336 in 1932, while all foreign countries took merchandise to the value of £117,925 in 1933 and £90,525 in 1932.

Fertilisers in Turkey

BETWEEN 70 and 80 per cent. of the Turkish population derive direct support from agricultural pursuits. Modern methods of agriculture are practically unknown, in fact, the agricultural methods practised by the peasant farmers have not changed appreciably for centuries, and total imports of fertilisers during 1932 were only 595 tons, against 1,455 tons in the previous year. German and British producers of fertiliser materials have carried on considerable educational work in Turkey, and the imports referred to are due chiefly to their efforts.

Finland Chlorine and Chlorates Trade

DESPITE the absence of domestic resources of chlorides, favourable trade in the Finnish pulp and match industries over recent years, led to larger local production of chlorine and potassium chlorate. Chlorine output, for example, increased in value from £3,787 to £24,615 between 1927 and 1930. In the same period potassium chlorate increased in value from £15,148 to £37,870. Matches and potassium chlorate are both exported, the latter averaging 2,650 metric tons in 1930 and 1931. A chlorine factory owned by Kymmene A.B. has increased its facilities to supply bleaching products to other consumers. In addition, the chlorate factory owned by the Swedish Match Trust supplies its factories abroad.

German Lithopone Trade

GERMANY'S foreign trade in lithopopne which, for the first time in years recorded, in 1932, a contraction of around 50 per cent., indicates a recovery this year of some of the previous losses, total German exports in the first four months of this year increasing to 4,030 metric tons, from 3,610 in the same period 1932. The gain was achieved largely through a considerable reduction in price. The expansion in exports was due almost entirely to the striking recovery in shipments of the pigment to Great Britain, the leading market, which took 1,512 tons for the first four months, a gain of over 1,200 compared with the same period in the previous year.

German Plant Makers' Report

THE report of the "Dechema" (German Association of Makers of Chemical Apparatus) for 1932 has just appeared. The clearly arranged information contained in the pamphlet of eight pages gives in concise form a review of the programme of work of the "Achema," which, notwithstanding the ever increasing depression in trade circles which prevailed until about October, 1932, has been successfully carried out in full. Details are given in the report on the progress in technical science, the work of the committees which deal with important question in connection with chemical apparatus and plant, *e.g.*, standardisation, the granting of financial support for the investigation of problems relating to technical and scientific questions, and the "Achema" Chemical Engineering Exhibition which will take place in Cologne from May 18 to 27, 1934. An index of the "Norm" leaflets on Standardisation of Chemical Apparatus and Plant of the "Dechema," which have appeared up to the present and of the "Norm" leaflets now in preparation are also published. Favourable support has already been extended to the "Achema VII." exhibition, which shows the determination in German industrial circles to revive business activity. As a result of the preliminary announcement that the "Achema VII.," 1934, would take place simultaneously with the exhibition of the German Chemical Society, a space of 2,500 sq. metres has already been booked by important firms.

FROM a study of the mechanism of cellulose of formation on feeding the acetobacter upon different polyhydric alcohols, J. Khouvaine (Compt. rend. de l'Acad. des Sciences, 1933, 1144) finds that mannitol leads to a much higher yield of cellulose than sorbitol. The respective figures were 19.11 and 1.66 per cent. of cellulose. Oxidation changes take place during the reaction and the heat developed suffices to enable the acetobacter to build up cellulose from the alcohol.

New Technical Books

FLOTATION PLANT PRACTICE. By Phillip Rabone. Pp. 141. Mining Publications, Ltd., 10s. 6d. net.

This book is based on some lectures delivered by the author on general flotation practice, which were designed to give the general engineer and student a broad conception of the subject with no more detailed information or theory than was necessary for the purpose. To make these lectures in book form of still greater use to engineers engaged in metalliferous mining and metallurgical work, an addition has been made of such cost and capacity figures as might be useful in preliminary calculation demanded in field work Since many of the milling and flotation methods employed in the treatment of the common classes of ores have now become reduced to a more or less standard basis, it is mainly these standardised methods which are described. A few special processes have been included, however, for the purpose of indicating the general trend of progress. Cost and power figures have been arrayed out on the same general lines, costs being given for plants treating up to 4,000 tons of ore per day. The individual chapters deal with crushing, grinding, flotation-reagents, machines, methods and concentrate and tailing disposal.

* * *

CHAPTERS IN MODERN INORGANIC AND THEORETICAL CHEMISTRY. By Ernest S. Hedges. Pp. 279. Edward Arnold and Co., 12s. 6d. net.

The chief feature of modern chemical thought is the recognition that inorganic, organic and physical chemistry can no longer be treated successfully as separate studies, but must form one united whole. Specialisation, the author stated, is essential for progress, but can be entirely satisfactory only when it is based on the broadest knowledge of the chemical properties and reactions of all kinds of matter. In this textbook he has therefore introduced the subject of organic substances just where they serve best for the purposes of illustration, and he has not attempted to differentiate between what may be called "inorganic" and what may be termed "physical." Descriptive chemistry is confined to some of the rarer elements, as the commoner elements are studied earlier in the student's careers. Valency and chemical combination are treated from the view-point of the electronic theory, and the chapters on complex ions, radioactivity, structure of the atom, isotopes and atomic weights are designed to lead to this end. The structure of crystals, inorganic catalytic reactions, corrosion, passivity and the protection of metals, inorganic colloids, the perodicity of the elements, allotropsy, and inter-metallic compounds are other subjects which receive individual treatment.

* * *

NITRO-CELLULOSE LACQUER MANUFACTURE. By R. G. Daniels. Pp. 121. Leonard Hill, Ltd. 10s. net.

This work belongs to a series of handbooks published under the general title of the Modern Chemical Industries Series, the aim of which is to give a straightforward description of present manufacturing operations and their scientific control. It represents the first attempt to treat cellulose lacquer manufacture on rational and practical lines. In contrast with previously published works on the subject it takes each constituent and each process of lacquer manufacture separately and considers their specifications, function, testing and incorporation. In the later chapters, the author endeavours to give the reader the benefit of his own experience of large scale manufacture, and indicates how finishes for any particular purpose are to be formulated, what faults likely to arise, and how the factory and chemist should combine for efficient production. The main chapter headings are nitro-cellulose, volatile liquid ingredients, resins and plasticisers, pigments, recording of information, principles of formulation, factory organisation and lay-out, buildings and plant, faults and their correction.

* * *

SPECTROSCOPY IN SCIENCE AND INDUSTRY. B. S. Judd Lewis. Pp. 94, with 10 plates. Blackie and Son, Ltd. 3s. 6d. net.

The author of this book shows how modern methods of spectroscopy are applied to practical problems in industry and in science, many of which cannot be solved by more ordinary means. He provides working formulæ for the experimental spectroscopist in such detail as to enable him to proceed from early exercises to an advanced state of proficiency. The book is essentially practical in its outlook, and discusses some of the many useful purposes served by modern spectroscopy. The detection and identification of traces of elements is a subject of ever-increasing importance, for it is surprising how often a few parts per million of some seemingly harmless impurity will affect the industrial uses of metal, glass or other material. The solution of problems not tractable by ordinary chemical means, and the complete analysis, both qualitative and quantitative, of very small specimens is equally important. One feature which distinguishes the book is the amount of attention paid to quantitative spectroscopy. Every spectroscopist has sought to render his findings quantitative, and many methods have been devised, several of which receive the author's attention. Absorption spectroscopy is also discussed, together with its practical applications.

* * *

PAPER, ITS HISTORY, SOURCES AND MANUFACTURE. By H. A. Maddox. Fourth Edition. Pp. 172. Sir Isaac Pitman and Sons, Ltd. 3s. net.

This handbook, one of the series dealing with common commodities and industries, provides a thoroughly good insight into paper and its manufacture. While primarily written for those concerned in making, handling and using paper—especially catering for the needs of the apprentice and the younger end of the industry—it has been the author's endeavour to arrange and modify the language in order to render the subject intelligible to the general reader, whose knowledge of technical matters and trade terms and formulæ is naturally less extensive. After dealing with the history and evolution of paper making, he discusses cellulose and its compounds; the treatment of rags, esparto grass and straw; the manufacture of wood pulp; beaters and refiners; loading, sizing and colouring; the paper making machine; finishes imparted to paper; and the technique of paper testing. There is an appendix on the fire hazards of paper mills, by Robert Taylor.

* * *

PHASE RULE STUDIES: An Introduction to the Phase Theory. By J. E. Wynfield Rhodes. With an introduction by E. L. Rhead. Pp. 131. Oxford University Press, 6s. net.

Owing to its many practical applications a knowledge of the phase rule has become indispensable in the equipment of the modern chemist. It is capable of application in many directions, not only to subjects that are palpably chemical in nature, but also to others that are not usually approached from a chemical standpoint. For instance, the principles are eminently applicable in mineralogy and metallurgy. This book bridges the gap that frequently occurs in chemical and related studies, but at the same time it is a suitable introduction to the subject for all students. It should supply a definite need and make the phase rule and its applications clear and helpful to many to whom the ordinary text-book would not appeal. The concluding chapter deals with experimental methods employed in phase rule work.

* * *

INTRODUCTORY COLLEGE CHEMISTRY. By Horace G. Deming. Pp. 590. Chapman and Hall Ltd., 18s. 6d. net.

This is an elementary course developed historically. Chemistry, the author points out, is often made unattractive by generalising too early. A far-reaching general principle cannot be properly appreciated unless presented against a background of general information. In this book each theoretical conclusion is therefore prefaced by a discussion of practical affairs, so directed to make the student feel the need for generalisation. More than usual space is given to topics that promise opportunity to put chemistry to use in every day life. Water softening, ventilation, the economic use of fuels, household refrigeration, and the principles of human nutrition are examples of the effort towards that end. By short-cutting preliminaries the student is brought to a study of the compounds of carbon, nitrogen and sulphur, with their interesting industrial applications, within a few weeks of the beginning of the course

Annual Meeting of Benn Brothers, Ltd.

Sir Ernest Benn on Difficulties Surmounted

THE thirty-seventh annual general meeting of Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE, was held at Bouverie House on August 4. In moving the adoption of the report and accounts and the declaration of the dividends announced last week, Sir Ernest Benn said there was a time not so very long ago, when in their ordinary conversation, if it was necessary to emphasise a point, they would have said " Oh, but I saw it in print." That fact would have been almost sufficient on most occasions to close an argument and to make a case complete. Now in 1933 they had reached a stage when, if any one mentioned that something had been seen in print, it was almost certain to raise a smile and was accepted generally as evidence that the thing was not so. The old tradition, " I have seen it in print," amounting to an assurance of accuracy, so far as the trade and periodical Press was concerned, still remained, and was bound up irrevocably with Bouverie House. It appeared as if, after twenty years of hard and difficult struggling, more on the part of their advertising than any other section, they were beginning to see the end of the absurd and suicidal circulation and sales stunt. They had reached a stage when they could see the wisdom of the attitude they had maintained for twenty years in having nothing whatever to do with the degrading policy of circulation rivalry.

Turning to the balance sheet, Sir Ernest Benn said a comparison with its predecessors revealed cause for hard thinking. They had succeeded in making all the appropriations which were an established part of their practice and had been able to carry forward a balance of £20 less than last year.

There was only one safe way of approaching business problems in these days, and it was by inquiring what had happened in 1913 and comparing it with what was happening to-day. If, for instance, they found some excellent official had a market price of 35s. in 1913 and knew his market price to-day was £4 10s. it was easy to see the difficulties. The problem was in better perspective, however, when the difference between 35s. and £4 10s. was recognised, and when it was understood that as a world they were engaged in searching out the unsound values of the past twenty years.

A slight improvement in trade was noticeable—an improvement which he attributed to the dogged determination and wonderful qualities of the middle class manufacturer and trader whom they represented and with whom they were associated. It was they who had made up their minds that they had got to pull through and they had succeeded despite all the absurd efforts to help them from outside.

Mr. Gordon Robbins, deputy-chairman, in seconding the motion, said that the year through which they had passed had been more difficult than any preceding it in his experience with the firm.

Miss Florence Robinson was re-elected a director and Cassleton Elliott & Co. were re-elected auditors.

The Shipping Exhibition

Preliminary Details of Exhibitors' Stands

AN indication of the wide scope of the Shipping, Engineering and Machinery Exhibition, to be held at Olympia from September 7 to 23, is given in a booklet issued by the organisers. This booklet contains advance information of many of the exhibits, the full list not yet being available, and may be obtained on application to the exhibition offices, Grand Buildings, Trafalgar Square, W.C.2. THE CHEMICAL AGE will be represented on the stand of Benn Bros., Ltd. (Stand 19, Row H), where readers and advertisers will be made welcome, although the exhibit will chiefly concern two of the associated journals " The Electrician " and the " British Trade Journal and Export World." Below is a list of some firms who have already booked stands, with brief particulars of the nature of the displays.

ALFA-LAVAL CO., LTD. (Stand No. 1, Row C) will demonstrate a 600 G.P.H. De Laval marine type oil purifier in operation and mounted on a rocking platform, the angle and roll of which represents the movements of a ship. In addition to this and other marine exhibits, the latest designs of De Laval separators, etc., will be shown.

BABCOCK AND WILCOX, LTD. (Stand No. 3, Row G), will show full size sections of their standard marine boiler, " SX " type marine boiler, and hopper bottom pulverised fuel fired furnace, and an exhibit of their new process of fusion welding. BRITISH OXYGEN CO., LTD. (Stand No. 3, Row H) will have on view a large selection of their productions, such as oxy-acetylene welding and hand-cutting equipment, pressure regulators, and common and rare gases for all industrial purposes. BROOM & WADE, LTD. (Stand No. 17, Row E) will exhibit a full range of " Broomwade " pneumatic tools and air compressors.

CAPE ASBESTOS CO., LTD. (Stand No. 2, Row K) will show as one of their chief exhibits a model boiler covered with blue asbestos mattresses. All varieties of asbestos materials will also be displayed. THE DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH (Stand Nos. 3 and 4, Row F) will be responsible for an exhibit showing how the Department's research work is assisting industry. The British Cast-Iron Research Association, the British Non-Ferrous Metals Association, and the Chemical Research Laboratory will be among the group of associations represented on this stand.

ELLIOTT BROS. (LONDON), LTD. (Stand No. 11, Row G) will include on their stand electrical and mechanical measuring, testing, recording and indicating apparatus and such equipment as current transformers and automatic temperature regulators. THE FOSTER INSTRUMENT CO. (Stand No. 14, Row H) will show a number of their productions prominent among which are the " Resitia " pyrometers with their patented method of spring-mounting the jewels and pivots. J. and E. HALL, LTD. (Stand No. 10, Row G), makers of refrigerating plant, will have on view three new designs, to be shown for the first time at the Exhibition.

KELVIN, BOTTOMLEY & BAIRD, LTD (Stand No. 1a, Row G) will exhibit many of their productions, including compasses, sounding machines and many kinds of medical apparatus. GEORGE KENT, LTD. (Stand No. 10, Row C) will show a large selection of metering and control equipment, having an unusually wide field of application. The " Kent " clear view screen will be a speciality. RICHARD KLINGER, LTD. (Stand No. 1a, Row E) intend to display their latest patented reflex gauges, suitable for oil distilling plants and cracking stills, in addition to various jointings.

THE MOND NICKEL CO., LTD., will be showing on Stand No 10, Row J. MUREX WELDING PROCESSES, LTD. (Stand No. 4, Row D) will include on their stand an original design depicting welding and cutting in a modern shipyard. Also exhibited will be electric arc welding plant and samples of electrodes. NEGRETTI AND ZAMBRA (Stand No. 4, Row B) will display some of their well-known instruments for marine and industrial use.

REAVELL & CO., LTD. (Stand No. 7, Row C) will show a comprehensive selection of their air compressors and exhausters. SIEBE, GORMAN & CO., LTD. (Stand No. 16, Row H) will exhibit gas masks, dust masks, safety goggles, gloves and other protective clothing, in addition to a large range of appliances for submarine work, oxygen and fresh-air breathing apparatus, fire extinguishers and many other examples of their well-known specialities. THE STREAM-LINE FILTER CO., LTD. (Stand No. 10, Row E) will exhibit a range of filters as applied to the reconditioning of used oils. SUPER-CENTRIFUGAL ENGINEERS, LTD. (Stand No. 6, Row D) will have on view several models of the Sharples supercentrifugal separators and clarifiers. A fully qualified staff of chemists and engineers will be in attendance.

HENRY WIGGINS & CO., LTD., will be exhibiting on Stand No. 10, Row J.

Decline in Dyestuffs Licences in 1932

A Review of the Past 12 Years

DURING the eleven years from 1921 to 1931 there was a steady increase in the quantities and values of dyestuffs and intermediates licensed for importation into the United Kingdom, but according to Board of Trade statistics reviewed by Sir Henry Sutcliffe Smith in his address to the recent annual meeting of the Colour Users' Association there was a decrease of over 20 per cent. in 1932 compared with 1931. This decline was due to the fact that towards the end of 1931 important changes took place in the economic conditions of this country. Between September and the end of the year imports increased considerably and in the last quarter of that year their value exceeded the average for the previous quarters by nearly 50 per cent. When, however, the full effect of the abandonment of the gold standard was felt, and higher prices came into force at the beginning of 1932, imports dropped to the normal level again. Imports have been remarkably consistent in weight and value during the last six years. For the last few years these imports have consisted almost entirely of dyestuffs not made in this country, and as and when the British makers extend their range and the foreign colour becomes automatically prohibited, it is necessary for the German and Swiss makers to place on the market some new dyestuff or speciality if they are to maintain their level of exports to this country. Insofar as they succeed in accomplishing this object, they give definite evidence of the progressive methods employed by them. The following table gives a complete list of licences granted for the importation of dyestuffs and intermediates over the past twelve years :—

	For importation from Germany.		For importation from Switzerland.		For importation from Other sources.		Total.	
	lb.	Value, £	lb.	Value, £	lb.	Value, £	lb.	Value, £
1921	671,032	197,466	1,796,754	763,299	209,719	82,056	2,677,505	1,042,821
1922	1,325,671	375,675	1,638,235	694,740	270,987	33,404	3,234,893	1,103,819
1923	1,817,571	493,499	1,412,616	459,861	461,253	36,177	3,691,440	989,537
1924	1,805,145	398,226	1,191,931	363,513	39,158	9,204	3,036,234	770,943
1925	2,175,262	334,749	1,157,270	307,754	66,522	9,081	3,399,054	651,584
1926	2,949,858	599,157	1,190,951	333,448	91,778	11,402	4,232,587	944,007
1927	3,644,152	710,938	1,230,815	306,595	115,389	16,480	4,990,356	1,034,013
1928	3,534,935	729,393	1,373,226	335,226	122,350	9,494	5,030,511	1,074,113
1929	3,899,412	743,951	1,787,796	402,788	127,069	11,385	5,814,277	1,158,124
1930	3,774,882	712,946	1,506,996	360,252	248,605	14,331	5,530,483	1,087,529
1931	4,123,153	837,960	2,191,109	519,909	158,641	14,259	6,472,903	1,372,128
1932	3,542,175	668,840	1,270,164	393,031	293,950	23,078	5,106,289	1,084,949

Chemicals in South Africa

Production of Power Alcohol from Maize

IN its recent annual report the South African Fuel Research Board declared that the production of power alcohol from maize would prove uneconomical, but this statement has met with considerable criticism, and a former director of the Fuel Research Institute has said that the industry "holds out very rich promise of being entirely successful." The question is actually an important one to South Africa, and especially to its industries and the maize producers. In most years there is a large maize surplus, and in the years where there is no surplus the 250,000 bags of maize necessary to maintain the activity of a factory of 2,000,000 gal. capacity could be imported from Rhodesia. The principal by-products of the factory should be oil, carbon dioxide and yeast, and the cattle fodder which is at present quoted as almost impossible to dispose of then becomes of secondary importance. There are rumours of the establishment of a company with a capital of about £230,000, but the industry would make better progress if it started on a small scale. Even for a larger industry, however, the opportunities for expansion are not so slight as some interests hold, for the annual needs of the country are estimated at about 20,000,000 gal. of power alcohol. There would be an eventual consumption of two or three million bags of surplus maize a year, which would be of importance to the primary producer. Difficulty is anticipated through competition with the industrial extraction of petrol from coal, but if alcohol can be successfully produced in competition with natural mineral oil in the United States, surely it can be produced successfully in South Africa. At any rate, the high ash content of South African coals may delay the establishment of a coal petrol industry for many years.

A Good Market for British Paints

South African trade in general is reviving, and the import and export figures for the first five months of 1933 are considerably better than those for the corresponding period of 1932. There is greater industrial activity, demanding larger quantities of drugs and chemicals. The demand for British chemicals is by no means normal but it is improved and this improvement promises to go on. The demand for paints and oils is also on the upward grade. South African dealers prefer to stock a paint that can be recommended for its sun-resisting qualities as well as its endurance under copious rains. Paints made in South Africa do not possess all these desirable qualities, and, therefore, for the better types of work, imported paints are preferred, and many of the best British brans are sold. In spite of the greater prevalence of sunshine in South Africa, Rhodesia and East and Central Africa, most of the brands of paints and varnish famous in Great Britain are suitable for sale in those countries, but if the manufacturer can introduce constituents that enable those paints the better to weather a warm climate it is so much to the credit of his reputation. Great Britain is the largest seller of paints in the Union.

Production of Tobacco Extract

Tobacco extract can be turned to many useful purposes, and a few South African factories are therefore producing it from scrap tobacco. They have of late been encountering unexpected difficulties, and it is held that unless special assistance is given the industry may go under. The Board of Trade and Industries has given some attention to this question, but it is not impressed, for it has reported that the quantity of waste high nicotine content tobacco is so slight that such factories are superfluous. It recommends the production of special nicotine tobaccos like *Nicotiana rustica*, and if ever its advice is taken it might give a more sympathetic ear to the requests of these factories.

A SPELLING error occurred in our report last week (page 132) of the application in the Chancery Division for the extension of the patent No. 118,667 for Lysolate (lysol tablets). The name of the first applicant should have read Carol Adolf Cofman-Nicoresti, of Twickenham.

News from the Allied Industries

Mineral Oil

AT THE ANNUAL BOARD MEETING of the Anglo-American Oil Co., held on August 3, three new directors were elected—Mr. G. Gordon Bell, Mr. R. A. Carder, and Mr. E. E. Soubrey.

Paper

AT A MEETING OF SHAREHOLDERS of the Combined Pulp and Paper Mills, held in London on August 3, Mr. J. W. Vincent, the liquidator appointed to wind up the company voluntarily, stated that in the case of four of the defendants in the recent action against whom damages had been obtained he had compromised. A fifth defendant had filed a petition in bankruptcy, while another was "very much a will of the wisp." As a result of the compromise, Mr. Vincent said, total assets would be about £7,500. The amount returnable to ordinary shareholders would be very small indeed, and the position of deferred shareholder quite hopeless. Replying to a question, the liquidator said that the amount the liquidation was likely to produce would be in the neighbourhood of 1d. in the £.

Fertilisers

FAILURE OF THE NITRATE PRODUCERS to re-form the international cartel may lead to intensive competition and the dumping of Chilean supplies in the European markets. The International Conference which met in Paris for the purpose of reviving the cartel and also to fix prices, ended in complete deadlock. The position of the Chilean nitrate industry is now far stronger than it was a year ago owing to the extensive reorganisation recently undertaken, and this may have induced the delegates from that country to take a firm stand at the conference. Whether or not that was so, the official commission for the liquidation of "Cosach" makes a vigorous defence against the charge that the Chilean industry was responsible for the failure of the conference. Chile, it is contended, has never practised dumping and is, therefore, not responsible for the breakdown; the negotiations failed because the synthetic producers left Chile in a dangerous position in a majority of the markets.

Iron and Steel

A NEW METHOD OF TREATING METALS, in such a way as is claimed to give them a very high degree of resistance to high temperatures and acids, is attracting attention. The Wycliff-Foundry Co., of Lutterworth, near Rugby, treating and manufacturing materials by the new process for various industries, under licence. Mr. M. Winbury, joint technical manager of the Follsain Syndicate, Ltd., states that the Follsain process will interest steel manufacturers, the tinplate industry, and machinery manufacturers in general. It is applicable to all ferrous metals and alloys, and consists in impregnating the surface by means of a penetration of metallic chlorides into the base metal by diffusion. This is obtained by a similar procedure to the case-hardening and annealing principle. Articles thus treated can resist oxidisation at extremely high temperatures, and the corrosive attack of acids such as nitric acid, hydrochloric acid, and salt water.

Carbonisation

IT IS OFFICIALLY ANNOUNCED by the British Coal Refining Processes, Ltd., that its first plant will be erected on the outskirts of Huddersfield. Sources of coal supplies have been secured, together with sufficient land for future expansion. The company's process is founded on the Salerni system of low temperature carbonisation and is expected to revolutionise the scientific treatment of raw coal. It is confidently anticipated that the results of this private enterprise on the part of Sir Eric Hambro will lead to the erection of large plants throughout all the coal areas in Great Britain, resulting not only in increased employment in the construction of plant and working of the process, but also in the coal mines. Only 75 per cent. of the raw coal treated by this process becomes "refined" coal, therefore, when the present wasteful burning of raw coal becomes a thing of the past, it will be necessary to mine fifty million tons of coal to supply the present domestic consumption of forty million tons. The company's technical experts are also studying the question of hydrogenating the oil obtained from the coal.

Sugar

AFTER A LAPSE OF THREE MONTHS the Second Anglo-Scottish Sugar Beet Corporation, Cupar, Fifeshire, is to take delivery of a raw sugar cargo amounting to 6,100 tons. The last cargoes were landed in April and May respectively.

Safety Glass

THE TRIPLEX SAFETY GLASS CO. has acquired the goodwill of Protectoglass, Ltd., which has a factory at Slough and whose contracts apply to several motor-car manufacturers, including Standard, Rover, Triumph, Vauxhall, and Citröen (England). The deal, which was completed a few days ago, does not involve the raising of any additional capital by the Triplex company. Its chief purpose is to increase the footage output in the Triplex factories in order to further distribute the company's overhead expenses and thus keep down the cost of raw materials. The Triplex company possesses ample liquid resources, notwithstanding the recent return to shareholders of 50 per cent. of their capital. Cash holdings at the end of June of last year amounted to almost £270,000, and, after providing for the return of 10s. per share made subsequent to that date, cash and investments together still amounted to approximately £125,000.

Lawn Tennis Tournament

The Semi-Finalists

THE three remaining matches in the third round of the Chemical Industry Lawn Tennis Tournament, arranged by THE CHEMICAL AGE, were played last Saturday at Edmonton, by the kindness of the British Oxygen Co., Ltd., with the following results:—

SINGLES.

R. George (J. Crosfield and Sons, Ltd.) beat D. Blow (British Drug Houses, Ltd.), 6—2, 6—3.

R. C. Pennington (J. Crosfield and Sons., Ltd.) beat A. Collins (British Oxygen Co., Ltd.), 6—0, 6—0.

DOUBLES.

R. C. Pennington and R. George (J. Crosfield and Sons, Ltd.) beat L. F. Grape and A. F. Childs (Borax Consolidated, Ltd.), 6—3, 6—2.

The completed draw for the semi-finals is therefore as follows:—

SINGLES.

Copp, C. G. Doulton & Co., Ltd., 28, High Street, Lambeth, London, S.E.1. (Reliance 1241.)	*v*	**Grape, L. F.** Borax Consolidated, Ltd., 16, Eastcheap, London, E.C. (Royal 1450.)
George, R. J. Crosfield & Sons, Ltd., Bank Quay, Warrington. (Warrington 800.)	*v*	**Pennington, R. C.** J. Crosfield & Sons, Ltd., Bank Quay, Warrington. (Warrington 800.)

DOUBLES.

Giltrow, L., & Hammond, G. F. Williams (Hounslow), Ltd., Hounslow. (Hounslow 2929.)	*v*	**Pennington, R. C. & George, R.** J. Crosfield & Sons, Ltd., Bank Quay, Warrington. (Warrington 800.)
Alldis, W. L., & Perridge, S. B. Brandhurst Co., Ltd., Vintry House, Queen Street Place, London, E.C.4. (Central 1411.)	*v*	**Haines, J., & Hawley, F. G.** Anglo-Persian Oil Co., Britannic House, Finsbury Circus, London, E.C.2. (National 1212.)

By the kind invitation of Johnson, Matthey and Co., Ltd., Hatton Garden, the finals are to be played at that company's courts at the Toll Gate, College Road, Dulwich, on the afternoon of Saturday, September 16. THE CHEMICAL AGE silver challenge doubles cup, which was won in 1931 by S. Newman and E. J. Lawrence ("Industrial Chemist") and in 1932 by S. E. Chaloner and W. Speakman (Monsanto Chemical Works, Ltd., Ruabon) will be presented to the winners of the doubles, to be held jointly for one year, and a handsome new trophy, THE CHEMICAL AGE silver challenge singles cup, will be presented to the winner of the singles for one year. In addition there are six solid silver cups to be won outright. Three "Invicta" cups, presented by Thomas Hill-Jones, Ltd., will be awarded to the two winners of the doubles and the winner of the singles respectively, while three "Lloyd-Willey" cups of similar pattern will be given to the two runners-up in the doubles and the runner-up in the singles.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

THE following market report is based on information supplied by the British manufacturers concerned, and unless otherwise qualified the figures quoted apply to fair quantities, net and naked at makers' works. Where no locality is indicated, the prices are general for the United Kingdom. Particulars of the London chemical market are specially supplied to THE CHEMICAL AGE by R. W. Greeff and Co., Ltd., and Chas. Page and Co., Ltd., and those of the Scottish chemical market by Chas. Tennant and Co., Ltd.

THE demand for chemical products on the London market has naturally been influenced by the holiday and there is little of special interest to report. The prices are practically without change and continue firm. The coal tar products market remains steady and prices are unchanged from last week. The Bank Holiday and its aftermath have had a quietening effect on business in chemical products on the Manchester market during the past week. New trade has been on a restricted scale, from the point of view of individual transactions and the quantities involved. On the whole, however, the atmosphere of the market is fairly cheerful and considering the period traders are not dissatisfied at the business put through. Meanwhile, quotations maintain their steady appearance. The heavy chemical market in Scotland has reacted to the English Bank Holiday, and business generally has been dull.

General Chemicals

ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.

ACID, ACETIC.—Tech. 80%, £38 5s. to £40 5s.; pure 80% £39 5s.; tech., 40%, £20 5s. to £21 15s.; tech., 60%, £28 10s. to £30 10s. LONDON: Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s. to £41 5s.; tech., 40%, £20 5s. to £22 5s.; tech., 60%, £29 5s. to £31 5s. SCOTLAND: Glacial 98/100%, £48 to £52; pure 80%, £39 5s.; tech. 80%, £38 5s. d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £39; tech. glacial, £52.

ACID, BORIC.—SCOTLAND: Granulated commercial, £26 10s. per ton; B.P. crystals, £35 10s.; B.P. powder, £36 10s. in 1-cwt. bags d/d free Great Britain in 1-ton lots upwards.

ACID, CHROMIC.—11d. per lb., less 2½%, d/d U.K.

ACID, CITRIC.—LONDON: 9½d. per lb.; less 5%. MANCHESTER: 9½d. to 9¾d.

ACID, CRESYLIC.—97/99%, 1s. 1d. to 1s. 7d. per gal.; 98/100%, 1s. 5d. to 2s.

ACID, FORMIC.—LONDON: £47 10s. per ton.

ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £48; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.

ACID, OXALIC.—LONDON: £47 7s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £49 to £52 ex store. MANCHESTER: £48 to £54 ex store.

ACID, SULPHURIC.—Average prices f.o.r. British makers' works, with slight variations owing to local considerations; 140° Tw. crude acid, £3 per ton; 168° Tw. arsenical £5 10s.; 168° Tw. non-arsenical, £6 15s. SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—LONDON: 11½d. per lb. SCOTLAND: B.P. crystals, 11d., carriage paid. MANCHESTER: 11¾d.

ALUM.—SCOTLAND: Lump potash, £9 per ton ex store.

ALUMINA SULPHATE.—LONDON. £8 5s. to £9 10s. per ton. SCOTLAND: £8 to £8 10s. ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE.—SCOTLAND: Lump, £32 per ton; powdered, £34, in 5-cwt. casks d/d buyers' premises U.K.

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £19 to £20. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

ANTIMONY OXIDE.—SCOTLAND: Spot, £24 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC.—LONDON: £19 c.i.f. main U.K. ports for imported material; Cornish nominal, £23 f.o.r mines. SCOTLAND: White powdered, £23 ex wharf. MANCHESTER: White powdered Cornish, £23 at mines.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARIUM CHLORIDE.—£11 per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.

BLEACHING POWDER.—Spot 35/37% £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 15s. in 5/6 cwt. casks.

BORAX, COMMERCIAL.—Granulated, £15 10s. per ton; powder, £17 packed in 1-cwt. bags, carriage paid any station Great Britain. Prices are for 1-ton lots and upwards.

CADMIUM SULPHIDE.—2s. 9d. to 3s. 1d.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums.

CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.

CARBON BLACK.—3½d. to 4¾d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£41 to £46 per ton, drums extra.

CHROMIUM OXIDE.—10d. to 10½d. per lb., according to quantity d/d U.K. Green, 1s. 2d. per lb.

CHROMETAN.—Crystals, 3½d. per lb. Liquor, £19 10s. per ton d/d

COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r. or ex works.

CREAM OF TARTAR.—LONDON: £4 per cwt.

DINITROTOLUENE.—66/68° C., 9d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

FORMALDEHYDE.—LONDON: £28 per ton. SCOTLAND: 40%, £28 ex store.

LAMPBLACK.—£45 to £48 per ton.

LEAD ACETATE.—LONDON: White, £34 per ton; brown, £1 per ton less. SCOTLAND: White crystals, £34 to £36; brown, £1 per ton less. MANCHESTER: White, £32 10s.; brown, £30 10s.

LEAD NITRATE.—£28 per ton.

LEAD, RED.—SCOTLAND: £24 to £26 10s. per ton d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £39 per ton, carriage paid.

LITHOPONE.—30%, £17 10s. to £18 per ton.

MAGNESITE.—SCOTLAND: Ground Calcined £9 per ton ex store.

METHYLATED SPIRIT.—61 O.P. Industrial 1s. 8d. to 2s. 3d. per gal. Pyridinised Industrial, 1s. 10d. to 2s. 5d. Mineralised, 2s. 9d. to 3s. 3d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NICKEL AMMONIUM SULPHATE.—£49 per ton d/d.

NICKEL SULPHATE.—£49 per ton d/d.

PHENOL.—9d. to 10d. per lb. nominal.

POTASH, CAUSTIC.—LONDON: £42; MANCHESTER: £41.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5¾d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.

POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99½/100% powder, £37. MANCHESTER: £38.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.

POTASSIUM NITRATE.—SCOTLAND: Refined Granulated £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 8¼d. per lb. SCOTLAND: B.P. crystals, 8¼d. MANCHESTER: Commercial, 8¼d. B.P., 8½d.

POTASSIUM PRUSSIATE.—LONDON: 8¼d. to 9d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8¼d.

SALAMMONIAC.—First lump spot, £42 17s. 6d. per ton d/d in barrels.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags, special terms for contracts.

SODA, CAUSTIC.—Solid 76/77° spot, £14 5s. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 15s. in casks, Solid 76/77%, £14 10s. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 10s. contracts.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£22 per ton. LONDON: £23.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 10s. ex quay or station. MANCHESTER: £10 10s.

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous, 5d. per lb. LONDON: 4d. per lb. with discounts for quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts. MANCHESTER: 4d. less 1 to 3½% contracts, 4d. spot lots.

SODIUM BISULPHITE POWDER.—60/62%, £16 10s. per ton d/d 1-cwt. iron drums for home trade.

SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

SODIUM CHLORATE.—£32 per ton.
SODIUM CHROMATE.—3¾d. per lb. d/d U.K.
SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £15 ex station, 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.
SODIUM NITRITE.—LONDON: Spot, £18 to £20 per ton d/d station in drums.
SODIUM PERBORATE.—LONDON: 10d. per lb.
SODIUM PHOSPHATE.—£12 10s. per ton.
SODIUM PRUSSIATE.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5¾d. ex store. MANCHESTER: 4¾d. to 5¾d.
SODIUM SILICATE.—140° Tw. Spot £8 5s. per ton d/d station, returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d. SCOTLAND: English material £3 15s.
SODIUM SULPHATE (SALT CAKE).—Unground Spot, £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 5s.
SODIUM SULPHIDE.—Solid 60/62% Spot, £10 15s. per ton d/d in drums; crystals 30/32%, £8 per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d. d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8.
SODIUM SULPHITE.—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot, £9 10s. d/d station in bags.
SULPHATE OF COPPER.—MANCHESTER: £17 per ton f.o.b.
SULPHUR.—£11 10s. per ton. SCOTLAND: Flowers, £11; roll, £10 10s.; rock, £9; ground American, £10 ex store.
SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quality.
SULPHUR PRECIP.—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.
VERMILION.—Pale or deep, 4s. 3d. to 4s. 5d. per lb.
ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.
ZINC SULPHATE.—LONDON AND SCOTLAND: £12 per ton.
ZINC SULPHIDE.—11d. to 1s. per lb.

Pharmaceutical and Fine Chemicals

CADMIUM IODIDE.—14s. 6d. per lb.
IRON AMMON. CITRATE.—B.P., 1s. 9d. per lb.; green, 2s. 5d. per lb.
IRON QUININE CITRATE.—9¾d. to 1s. 0½d. per oz.
LINALOL (ex Shui oil).—5s. 9d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 7s. 6d. per lb.; ex Shui oil, 6s. 6d.
MENTHOL.—A.B.R. recryst., B.P., 15s. per lb.; synthetic detached crystals, 8s. 6d. to 10s. 6d. per lb.
PHENACETIN.—4s. to 4s. 6d. per lb.

Essential Oils

BOURBON GERANIUM.—24s. 9d. per lb.
CAMPHOR, BROWN.—70s. per cwt.
CAMPHOR, WHITE.—75s. per cwt.
EUCALYPTUS.—Australian B.P. 70/75%, 1s. 2d. per lb.
LEMON.—4s. 6d. per lb.
LEMONGRASS.—3s. 5d. per lb.
ORANGE, SWEET.—6s. 6d. per lb.
PALMA ROSA.—8s. per lb.
PEPPERMINT.—Wayne County, 14s. 3d. per lb.
PETITGRAIN.—4s. 9d. per lb.

Intermediates and Dyes

IN the following list of intermediates delivered prices include packages except where otherwise stated:—
ACID, BENZOIC, 1914 B.P. (ex Toluol).—1s. 9½d. per lb.
ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.
ACID, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.
ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100% d/d buyer's works.
ACID, SULPHANILIC.—Spot, 8d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.
BENZIDINE BASE.—Spot, 2s. 5d. per lb. 100% d/d buyer's works.
p-CRESOL 34-5° C.—1s. 9d. per lb. in ton lots.
m-CRESOL 98/100%.—2s. 3d. per lb. in ton lots.
DICHLORANILINE.—2s. 3d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.
DINITROBENZENE.—8d. per lb.
DINITROTOLUENE.—48/50° C., 8d. per lb.; 66/68° C. 8¾d. per lb.
DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.
α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.
β-NAPHTHOL.—Spot, £78 15s. per ton in paper bags; £79 15s. in casks, in 1-ton lots.
α-NAPHTHYLAMINE.—Spot, 11½d. per lb., d/d buyer's works.
β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 10d. per lb.
m-NITRANILINE.—Spot, 2s. 7d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. per lb.; 5-cwt. lots, drums extra.
NITRONAPHTHALENE.—9d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.
o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 11d. per lb., d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 4d. per lb.

Coal Tar Products

ACID, CARBOLIC.—Crystals, 9d. to 10d. per lb.; crude, 60's, 2s. 5d. to 2s. 6d. per gal.; 2% water 3s. 0¾d. MANCHESTER: Crystals, 9¼d. per lb.; crude, 2s. 7d. per gal. SCOTLAND: 60's, 1s. 7d. to 1s. 8d.
ACID, CRESYLIC.—99/100%, 11d. to 1s. 8d. per gal.; pale, 98%, 1s. 4d. to 1s. 5d.; pale 95%, 11d. to 11½d.; dark, 10d., all according to specification; refined, 1s. 8d. to 1s. 9d. LONDON: 98/100%, 1s. 3d.; dark, 95/97%, 11d. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; 97/99%, 1s. to 1s. 1d.; dark, 97/99%, 11d. to 1s.; high boiling acid, 2s. 6d. to 3s.
ANTHRACENE OIL.—Strained, 4½d. per gal.
BENZOL.—At works, crude, 9d. to 9½d. per gal.; standard motor 1s. 4d. to 1s. 4½d.; 90%, 1s. 5d. to 1s. 6d.; pure, 1s. 7½d. to 1s. 8d. LONDON: Motor, 1s. 6½d. SCOTLAND: Motor, 1s. 6½d. to 1s. 7½d.; 90%, 2s. 0½d. to 2s. 1½d.
CREOSOTE.—B.S.I. Specification standard, 3d. per gal. f.o.r. Home, 3¾d. d/d. LONDON: 3d. to 3¼d. f.o.r. North; 4d. to 4½d. London. MANCHESTER: 2½d. to 3¼d. SCOTLAND: Specification oils, 3½d. to 4d.; washed oil, 3½d. to 4d.; light, 3d. to 3½d.; heavy, 4½d. to 5d.
NAPHTHA.—Solvent, 90/160%, 1s. 4d. to 1s. 5d. per gal.; 95/160%, 1s. 7d.; 90/190%, 9d. to 1s. 1d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 11d. to 1s. 2d.
NAPHTHALENE.—Crude, Hot-Pressed, £6 1s. 3d. per ton. Flaked, £10 per ton. Purified crystals, £9 10s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 70s. to 75s.
PITCH.—Medium soft, £4 per ton. MANCHESTER: £4 f.o.b. LONDON: £3 15s. f.o.b. East Coast port.
PYRIDINE.—90/140, 4s. to 4s. 6d. per gal.; 90/180, 2s. to 2s. 6d. SCOTLAND: 90/160% 4s. to 5s.; 90/220%, 3s. to 4s.
REFINED COAL TAR.—SCOTLAND: 4d. per gal.
TOLUOL.—90%, 2s. 2d. to 2s. 3d.
XYLOL.—Commercial, 2s. to 2s. 1d. per gal.; pure, 2s. 3d. to 2s. 4d.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 15s. to £9 per ton. Grey £14 to £15. Liquor, brown, 30° Tw., 6d. per gal. MANCHESTER: Brown, £9 10s.; grey, £16.
ACETIC ACID, TECHNICAL, 40%.—£17 to £18 per ton.
AMYL ACETATE, TECHNICAL.—95s. to 110s. per cwt.
CHARCOAL.—£6 to £11 per ton.
WOOD CREOSOTE.—6d. to 2s. per gal., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 7d. to 4s. per gal. Solvent, 3s. 9d. to 4s. 9d. per gal.
WOOD TAR.—£2 to £6 per ton.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—£6 15s. per ton, delivered in 6-ton lots to consumer's nearest station.
NITRATE OF SODA.—£8 16s. per ton delivered in 6-ton lots to consumer's nearest station.
CYANAMIDE.—£7 per ton for July/August delivery carriage paid to any railway station in Great Britain in lots of 4 tons and over.
NITRO-CHALK.—£7 5s. per ton delivered in 6-ton lots to consumer's nearest station.
CONCENTRATED COMPLETE FERTILISERS.—£10 9s. 6d. to £11 per ton according to percentage of constituents.

Latest Oil Prices

LONDON, August 9.—LINSEED OIL was firmer. Spot, small quantities, £23 5s.; Aug., £20 5s.; Sept., £20 7s. 6d.; Jan.-April, £21 5s., naked. RAPE OIL was quiet. Egyptian crude, £28 10s.; technical refined, £30, naked, ex wharf. COTTON OIL was slow; Egyptian crude, £21 10s.; refined common edible, £24; deodorised, £26, naked, ex mill. TURPENTINE was quiet. American, spot, 49s. per cwt.
HULL.—LINSEED OIL.—Spot, £21 2s. 6d. per ton; Aug., £20 12s. 6d.; Sept.-Dec., £20 15s.; Jan.-April, £21 10s. COTTON OIL.—Egyptian crude, spot, £22; edible refined, spot, £23 15s.; technical, spot, £23 15s.; deodorised, £25 15s., naked. PALM KERNEL OIL.—Crude, f.m.q., spot, £17 10s., naked. GROUNDNUT OIL.—Extracted spot, £24 10s.; deodorised, £28 10s. RAPE OIL.—Extracted, spot, £27 10s.; refined, £29. SOYA OIL.—Extracted, spot, £20 15s.; deodorised, £23 15s. per ton. COD OIL, 21s. per cwt., nominal. CASTOR OIL.—Pharmaceutical, spot, 39s.; first, 34s.; second, 31s. per cwt. TURPENTINE.—American, spot, 51s. 6d. per cwt.

Inventions in the Chemical Industry

Specifications Accepted and Applications for Patents

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Compound Glass

IN the manufacture of compound glass, glass plates are coated with a solution of rubber capable of vulcanisation to which has been added a solution of a resin or artificial resin, as described in Specification No. 388,287 of A. Kampfer and A. C. Plötze. Low boiling solvents, *e.g.*, methylene chloride, are preferably used, and softening agents such as esters of phthalic acid, particularly dibutylphthalate, and vulcanisation accelerators may be added. Vulcanisation of the rubber may be effected by blowing sulphur-containing vapours, *e.g.*, sulphur dichloride vapour, on the coated plates.

Dehydrating Salts

SALTS such as magnesium sulphate have their water of crystallisation extracted, without melting them, by heating *in vacuo*, using a counterflow of superheated exhaust steam as the drying agent, as detailed in Specification No. 388,553 of Metallges, Akt.-Ges. Steam plate or tubular vacuum drying apparatus may be used. The vacuum may be increased as dehydration progresses, and in this case, if desired, saturated steam may be used as drying agent at a uniform drying temperature. Superheated live steam may be used to complete dehydration and, if desired, be passed into direct contact with the salt.

Manufacture of Bleaching Powder

IN the production of bleaching powder, hydrate of lime is treated with chlorine in amounts such that the "wet point" is not reached, corresponding to an available chlorine content of 30-32 per cent., or even to 34 per cent. if water of reaction be partially removed during the chlorination. The product, having a water content of about 4-8 per cent. is dried, and mixed with an anhydrous calcium hypochlorite compound, containing, say, 73-75 per cent. available chlorine to give a product containing 36-37 per cent. or more available chlorine. (See Specification No. 391,078, of A.L. Mond.)

Non-Inflammable Lacquers

NON-INFLAMMABLE solutions, plastics, lacquers, etc., are produced by dissolving a degraded cellulose nitrate of low viscosity (obtained by boiling primary cellulose nitrate with water or dilute acids) in a solvent mixture containing carbon tetrachloride in amount at least twice that of the actual solvent present. Known solvents such as thyl acetate, acetone, or amyl acetate may be employed with the carbon tetrachloride, together, if desired, with the customary plasticisers. Spraying lacquers, made up with cellulose nitrate of the above mentioned type, may be diluted with carbon tetrachloride to give a non-inflammable product. (See Specification No. 390,867, of A. Eichengrün.)

Purifying Nickel Oxide

OXIDES and hydroxides of nickel and cobalt forming the active material of alkaline accumulators are treated with a moderately strong acid such as citric acid to remove impurities such ac compounds of iron, aluminium, calcium, magnesium, potassium, sodium, zinc, barium, beryllium and lithium. Purification may be facilitated by applying a reverse charge to the battery before or during the acid treatment, caustic potash solution being used as electrolyte in the first case and the acid used in the purifying treatment being also used as electrolyte in the second case. Alternatively acid potassium citrate may be used as electrolyte. (See Specification No. 391,458, of A. G. Burnell and the Drumm Battery Co., Ltd.)

Refining Fats and Waxes

FATS, fatty oils and waxes are refined by treatment with alkylolamines mixed or not with liquid ammonia; an alkylolamine soap is preferably added to the amine when the free fatty acid content of the material treated is low. Mono-, di-, and tri-ethanolamines or mixtures there of are preferred for refining vegetable oils, may be by countercurrent treatment. In an example, raw cotttonseed oil is treated at 40° C. with ½ vol. of monoethanol amine and the mixture allowed to settle. The oil layer is separated and is freed from any amine by heating *in vacuo* and blowing an inert gas therethrough, or by washing with water. The amine is recovered from the solution of fatty acids, colouring matter and other impurities by distillation, preferably under an absolute pressure of about 25-30 mm. and with steam at about 120° C., the vapours being passed through a rectifying column to separate the amine from condensed steam. Coconut oil is treated at about 35° C. (See Specification No. 391,658, of L. Rosenstein and W. J. Hund.)

Specifications Accepted with Dates of Application

PROTECTING AGENTS FOR ACID AND ALKALINE TREATMENT OF ANIMAL FIBRES.—A. L. Mond (I. G. Farbenindustrie). Oct. 19, 1931. 396,050.

CONVERSION OF HEAVY HYDROCARBON OILS INTO OILS OF LOWER BOILING POINT BY HEAT TREATMENT IN THE PRESENCE OF HYDROGEN.—Processco, Ltd. Dec. 13, 1930. 396,065

MANUFACTURE OF SILICON CARBIDE BODIES.—Carborundum Co., Ltd. (Globar Corporation). Jan. 15, 1932. 396,088.

METHOD OF PURIFYING MERCURY WHICH HAS BEEN USED AS A CATHODE IN ELECTROLYSIS.—K. W. Palmaer. May 1, 1931. 396,041.

SIMULTANEOUS TREATMENT OF CRUDE PETROLEUMS OR THE LIKE AND BITUMINOUS COALS OR THE LIKE.—F. S. Woidich. Jan. 20, 1931. 396,054.

RESINOUS COMPOSITIONS AND METHODS OF MAKING THE SAME.—British Thomson-Houston Co., Ltd. Jan. 26, 1931. 396,071.

PROCESS FOR ELIMINATING ARSENIC AND ANTIMONY FROM IRON ORES AND MANGANESE ORES.—Vereinigte Stahlwerke Akt.-Ges. Feb. 9, 1931. 396,058.

REFRIGERATION WITH SOLID CARBON DIOXIDE.—F. Heywood and Imperial Chemical Industries, Ltd. Jan. 26, 1932. 396,059.

PRODUCTION OF NITROGENEOUS AND/OR PHOSPHATIC MIXED FERTILISERS OF DESIRED COMPOSITION BY TREATMENT OF RAW PHOSPHATES WITH NITRIC ACID.—Ruhrchemie Akt.-Ges. Jan. 29, 1931. 396,092.

MANUFACTURE OF AMINOHALOGEN-ANTHRAQUINONE SULPHONIC ACIDS.—I. G. Farbenindustrie. Jan. 29, 1931. 396,077.

PROCESS FOR THE MANUFACTURE OF AZO DYESTUFFS.—I. G. Farbenindustrie. Feb. 9, 1931. 396,078.

PROCESS FOR THE MANUFACTURE OF VINYL SUBSTITUTED AROMATIC COMPOUNDS.—I. G. Farbenindustrie. Jan. 28, 1931. 396,079.

COATING COMPOSITIONS.—E. I. Du Pont de Nemours and Co. Jan. 28, 1931. 396,081.

PROCESSES AND APPARATUS FOR THE DISTILLATION OR DEODORISATION OF LIQUIDS AT LOW PRESSURE.—W. J. Tennant (N. H. S. van Reesema). Jan. 29, 1932. 396,095.

PROCESS FOR THE MANUFACTURE OF 2-ALKYLAMINOBENZENE-1-CARBOXYLIC ACID-4-SULPHONIC ACIDS.—A. Carpmael (I. G. Farbenindustrie). Jan. 30, 1932. 396,100.

MANUFACTURE OF AN ADENOSINE PHOSPHORIC ACID.—I. G. Farbenindustrie. Feb. 23, 1931. 396,135.

SATURATION OF LIME CONTAINING OR LIME TREATED SUGAR JUICES OR SYRUPS BY GASEOUS SULPHUR DIOXIDE OR CARBON DIOXIDE.—A. Leduc. Feb. 20, 1931. 396,136.

Applications for Patents

HYDROGENATION OF FURFURAL.—E. I. Du Pont de Nemours and Co. July 24. (United States, July 22, '32.) 20803.

AZO DYESTUFFS.—E. I. Du Pont de Nemours and Co. July 26. 21085.

AZO DYESTUFFS.—E. I. Du Pont de Nemours and Co. July 27. 21130.

ORGANIC MERCURY COMPOUNDS.—E. I. Du Pont de Nemours and Co. July 28. 21286.

TREATMENT OF AMMONIACAL LIQUOR CONTAINING PHENOLIC BODIES.—D. M. Henshaw and W. C. Holmes and Co., Ltd. July 25. 20897.

DESTRUCTIVE HYDROGENATION OF CARBONACEOUS MATERIALS.—R. Holroyd and Imperial Chemical Industries, Ltd. July 29. 21343.

TRANSFERRING HEAT FROM COMPRESSED GASES.—H. Holzwarth. July 28. 21277.

MANUFACTURE OF ORGANIC COMPOUNDS.—I. G. Farbenindustrie. July 24. 20829.

MANUFACTURE OF ARSENO COMPOUNDS.—I. G. Farbenindustrie. July 24. 20832.

MANUFACTURE OF AZO DYESTUFFS.—I. G. Farbenindustrie. July 25. 20980.

SENSITISATION OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS.—I. G. Farbenindustrie. July 27. 21141.

MANUFACTURE OF PHYSIOLOGICALLY-ACTIVE PREPARATION.—I. G. Farbenindustrie July 28. 21307.

MONOAZO DYESTUFFS.—Imperial Chemical Industries, Ltd., and A. H. Knight. July 25. 20961.

DRYING OILS.—Imperial Chemical Industries, Ltd. July 26. 20996.

MANUFACTURE OF MOTOR FUELS, ETC.—J. Y. Johnson (I. G. Farbenindustrie). July 29. 21358.

MANUFACTURE OF AMMONIUM SULPHATE.—Naamlooze Vennootschap De Bataafsche Petroleum Maatshappij. July 24. (United States, Aug. 16, '32.) 20853.

From Week to Week

MR. H. MCMORAN, Galashields, who won the Craig Scholarship for chemistry and dyeing at the Scottish Woollen Technical College, has been awarded the degree of B.Sc. of the University of London.

PLANT FOR THE ELECTROLYTIC PRODUCTION of hydrogen peroxide with a provisional daily output of 1,000 kg. is being erected at Mährisch-Ostrau. It is anticipated that production will commence in the autumn of this year.

A DELEGATION FROM THE LANCASHIRE COTTON INDUSTRY, which, we understand, will include Sir William Clare Lees, is to be sent to India to discuss with the industry there the question of Japanese competition in cotton cloths. It is hoped that the talks will be held before the Japanese delegation arrives.

THE LATEST ENTERPRISE OF UNILEVER, LTD., is the creation of the Unilever Savings Bank, Ltd., which was registered on August 2 with a nominal capital of £10,000. The company will be conducted for the benefit of the staff of Unilever's and its subsidiary, controlled or associated companies.

THE HABIT among French petrol distributors of introducing a certain proportion of alcohol has been severely criticised by the French Automobile Club. This practice is encouraged by the Government as a means of stimulating agriculture and increasing the consumption of home-produced alcohol.

A FIRE WHICH BROKE OUT RECENTLY at the colour manufacturing works of Colthurst and Harding, Ltd., Bristol, was the cause of great alarm owing to the dense volumes of smoke. However, the fire was confined to an isolated pitch house, and was soon extinguished.

THE BRITISH INDUSTRIES FAIR, 1934, will be held from February 19 to March 2. The Department of Overseas Trade, 35 Old Queen Street, S.W.1, will furnish all information regarding the fair at Olympia and the White City, while the Birmingham section at Castle Bromwich is in the hands of the Birmingham Chamber of Commerce, 95 New Street, Birmingham.

THE SHAPARIA IRON AND STEEL WORKS, LTD., Bombay, have started on a new venture, namely, the manufacture of lead-wool. The product is being marketed under the name of "lead-ulite." It is stated that where it has been used, it has given good results, and is thoroughly economical as one ton of lead wool replaces two tons of molten lead and requires less labour and no heating, besides being free from losses due to oxidation or dross.

IMPORTS OF CHEMICALS INTO THE IRISH FREE STATE during June last amounted to £142,837, as compared with £135,098 in the corresponding month of the previous year. The six months' figures reveal a decline in the volume of trade. In January-June of this year the total value of imports was £554,113, as compared with £655,528 in the corresponding period of 1932. Chemical fertilisers were imported to the value of £7,169, as against £11,742 in June of last year.

THE UNION RADIUM INSTITUTE, LTD., has been registered in Pretoria, with a capital of £15,000, divided into 60,000 shares of 5s. each. An agreement has been entered into between Mrs. M. Frankforth and the trustee for the company, and in this it is provided that the sole right to use the radium therapy preparation of Dr. Alois Fischer, of Vienna, which was acquired by the vendor for the territory of Africa south of Equator, is to be sold to the company.

AS THE RESULT OF EXPERIMENTS at the Institute of Paper Chemistry, Lawrence College, Appleton, Wis., U.S.A., collaborating with the New Jersey Zinc Co., the use of zinc pigment to give added opacity to thin mail order catalogue paper has been worked successfully. This work was begun at the instigation of a mail order firm and has since been carried through the experimental stage and into test runs in commercial paper mills. It was found that the zinc pigments produce all the desired effects of whiteness to a greater degree than previously, and of a high degree of opaqueness, and that the pigments do not weaken the sheet.

THE CHEMICAL BY-PRODUCTS PLANT at the Coventry Corporation Gasworks, Foleshill, was involved in a serious fire on Tuesday afternoon. Damage amounting to several thousands of pounds was done, and Coventry Fire Brigade were engaged for three hours. Towards midday an employee noticed that the grass bank adjoining the railway which runs near the building was on fire. By the time the fire brigade reached the scene, which is over three miles from the centre of the city, the flames had spread to the gasworks. Part of the structure is made of tar-coated pine wood, and the rapidity with which the fire spread, combined with dense fumes from the thirty tons of nitric and sulphuric acid in two large tanks which were involved, considerably hampered the men in dealing with the outbreak. Three turbine pumps were brought into operation, however, and the firemen were able to check the flames.

THE ANNUAL SPORTS of the Castner Kellner Alkali Co. were held at Widnes on July 29. The prizes were presented by Mrs. J. Savage, wife of the president of the club. A vote of thanks to Mrs. Savage was proposed by Mr. E. O. Glover.

THE AMERICAN SUGAR CONFERENCE recently held at Washington intends to set up a sugar stabilisation board to be composed of one member from each of the following interests: sugar beet growers, sugar beet refiners, raw sugar producers of the United States, refiners of the United States, Hawaii, Puerto Rico, Philippine Islands and Cuba.

THE PROGRAMME for the forthcoming session of the No. 1 London group of the Industrial Administration Students' Union, which is sponsored by the Institute of Industrial Administration, has been made public. The actual dates of the lectures have yet to be announced, but it has been decided that they shall be given at Thames House, Millbank, S.W.1.

THE IRISH FREE STATE GOVERNMENT has on hand plans for the formation of an Irish Sugar Company with a capital of £2,000,000, the Minister of Finance having powers to acquire a quarter interest. Three new factories will be erected to deal with next year's beet crop, and it is hoped that production will cover almost all home requirements.

THE MORRISON NORTH PIT, Annfield Plain, which has closed down temporarily for the mining of coal, is to remain open for the working of witherite. It is officially stated that the miners working the witherite are to be retained. The owners, the Holmside and South Moor Colliery Co., have erected special machinery for crushing the mineral, and a large shed has been built for storage purposes.

BRITISH COAL REFINING PROCESSES, LTD., will set up its first plant near Huddersfield. It has already arranged for the source of coal supply, together with sufficient land for future expansion. The firm's process is based on the Salerni system of low temperature carbonisation, and it is hoped that it will be possible to erect large plants in every coal mining area of the country. Sir Eric Hambro is the chief backer of this enterprise.

APPLICATIONS FOR LICENCES under the Dyestuffs (Import Regulation) Act, 1920, during July totalled 645, of which 583 were from merchants or importers; to these should be added three cases outstanding from the previous month. The Dyestuffs Advisory Licensing Committee granted 634 licences and referred seven of the applications to British makers of similar products, leaving seven cases outstanding at the end of the month.

AWARDS FOR THE YEAR 1933-1934 have been made by the Salters' Institute of Industrial Chemistry and approved by the Court of the Salters' Company. Fellowships have been renewed to S. C. Britton, Cambridge; E. H. T. Hoblyn, London; G. Pearce, Birmingham; and P. Chisholm Young, Cambridge. Fellowships have been awarded to N. S. Kelland, Oxford; J. D. Rose, Oxford; F. C. Storrs, London; and C. W. Woolgar, London.

AN IMPORTANT FINANCIAL GROUP, including representatives of oil companies and the German Dye Trust, is reported to be investing £5,000,000 in a project to extract oil from New South Wales coal. Samples of the coal have been sent abroad for analysis, and it is estimated that the yield will be 180 gallons of crude oil per ton. The petrolific value is greater than anticipated, and it is hoped that petrol from this coal may be sold at 1s. a gallon.

WE REGRET TO ANNOUNCE THE DEATH, at the age of 78 years, of Professor Henry George Greenish. Professor Greenish served his apprenticeship in pharmacy with his father, and in 1875 he became a Bell scholar. He was intimately associated with Continental chemists of the front rank, and had achieved an international reputation at an early age. He was also partly responsible for several revised editions of the British Pharmacopoeia, including that published last year. Last month he retired, owing to ill health, from his activities with the Pharmaceutical Society and the University of London. His home was at Grove Road, London, N.W., and it was there that he died.

IMPORTANT DEVELOPMENTS in connection with the production of oil from coal were foreshadowed by Mr. William MacLellen, the chairman of the Bengal Iron Company, at the annual meeting of the shareholders on August 9. Recently, he said, the directors had been investigating the question of treating coal in India, and a week or two ago an option was arranged for a period of about two years on one-half of the Indian rights of British Coal Refining Processes, Ltd. Those rights were based on the Salerni system of low temperature carbonisation of coal, which seems to be specially suitable for Indian coals. Owing to the large quantities of low-grade coal in India, which, apparently, can be profitably treated by the low temperature system, there may be a very big development in coal refining operations in that country in the future.

Company News

Yorkshire Dyeing Co.—A dividend of 6 per cent., less tax, is announced for the year ended June 30, 1933.

William Fulton and Sons.—A profit of £17,531 is reported for the year ended June 30 last. A dividend of 5 per cent., against 4 per cent. last year, is recommended, and £9,300 is placed to depreciation.

Gas Chambers and Coke Ovens, Ltd.—The profit for the twelve months to March 31 last, after providing for directors' fees, is £4,398, to which is added the balance brought forward of £1,319, making a total of £5,717. The directors recommend the payment of a dividend at the rate of 5 per cent. (less income tax at 5s. in the £) on the preferred ordinary shares, and that £550 be reserved for income tax, leaving a credit balance to carry forward of £2,155.

Anglo-American Oil Co.—The report for the year 1932 states that £750,000 has been transferred from general reserve to investment reserve, bringing value of investments more into line with current conditions. There was a gross loss on trading of £12,611, to which is added depreciation £847,685. Debenture interest £94,951, tax £7,807, transfer to investment reserve of profit on realisation of shares £50,709, making £1,013,763, less dividends received £39,015, interest and exchange £24,075, and profit on realisation of shares £50,709, giving a net loss of £899,964, from which is deducted surplus brought forward £344,735, leaving a loss to be carried forward £555,229, against a credit of £344,735.

New Companies Registered

Aimee Lloyd & Co. (1933), Ltd., 23 Panton Street, Haymarket, S.W.1. Registered August 4. Nominal capital £1,600 in £1 shares. To acquire the business carried on by Aimee Lloyd and Co., Ltd., and carry on the business of manufacturers of soaps, shaving soap and cream, etc. Directors: B. A. Turner, 109a Albert Bridge Road, S.W.11; E. M. Wright, and J. Turner.

Comlosit Chemicals Works, Ltd., Diamond House, 37-8 Hatton Garden, E.C.1. Registered August 5. Nominal capital £100 in 10s. shares. To acquire the trade mark "Comlosit" and to carry on the business of chemical producers, manufacturers of and dealers in all kinds of chemicals, etc. Directors: F. H. Simmons, "Clovelly," Green Lanes, N.13; D. Komlos and B. Weisz.

Hermidt Canker Cure Co., Ltd., 116 Hope Street, Glasgow, C.2. Registered in Edinburgh on August 2. Nominal capital £100 in £1 shares. Manufacturers of, dealers in or agents for the preparation, purchase and sale of preparations and remedies for the prevention or cure of canker in trees or any other plants, etc. Directors; W. C. Smith, 14 Monreith Road, Newlands, Glasgow, S.3; L. W. Fleming, G. Schmidt and Mrs. B. O'Herlihy.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Palestine.—A commission agent desires to represent United Kingdom manufacturers and exporters of sugar, acid oils, textiles of all kinds, corrugated iron sheets, in Palestine. (Ref. No. 149.)

Canada.—The British Trade Commissioner at Vancouver, British Columbia, reports that a firm in Alberta desires to receive particulars of any process for the wet washing of coal which would be suitable for certain high-ash sections of its mines. (Ref. A.Y. 11922.)

South Africa.—The British Trade Commissioner at Johannesburg reports that the South African Railways and Harbours Administration is calling for tenders (Tender No. 84), to be presented in Johannesburg by October 9, 1933, for the supply of ready-mixed and paste paints, paint ingredients, etc. (Ref. B.Y. 7634.)